

03-07-05

spw 2611



UV-81

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Joshua A. Rosenthol et al.  
Application No. : 09/262,658 Confirmation No. : 9736  
Filed : March 4, 1999  
For : PROGRAM GUIDE WITH USER DESIGNATED  
FAVORITE THEMES  
Art Unit : 2611  
Examiner : Jason P. Salce

EXPRESS MAIL CERTIFICATION

"Express Mail" mailing label number EV626909934US.

Date of Deposit March 4, 2005.

I hereby certify that this transmittal letter and the other papers and fees identified in this transmittal letter as being transmitted herewith are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. § 1.10 on the date indicated above and are addressed to Mailstop Petitions, Hon. Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Mailstop Petitions  
Hon. Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

New York, New York

TRANSMITTAL LETTER

Transmitted herewith are  
(1) Petition to Withdraw Holding of  
Abandonment (in duplicate);

- (2) a copy of the postcard receipt for a January 13, 2005 filing;
- (3) a copy of the Express Mail Label, date stamped January 13, 2005;
- (4) a copy of the Notice of Abandonment;
- (5) copies of documents filed on January 13, 2005, including (a) Reply to the July 13, 2004 Office Action, (b) Transmittal Letter (in duplicate), (c) a \$1020 check for a three-month extension fee, (d) Formal Drawings (sheets 1-16), (e) Supplemental Information Disclosure Statement, (f) copies of 26 Foreign patent documents and 2 U.S. Patent Applications, (g) PTO-1449 Form (in duplicate), and (h) a check for the \$180 IDS filing fee; and
- (6) a postcard.

No fee is believed to be due. However, the Director is hereby authorized to charge any fee due or to credit any overpayment to Deposit Account No. 06-1075. A duplicate copy of this Transmittal Letter is enclosed herewith.

Respectfully submitted,



Andrew Van Court

Reg. No. 48,506

Agent for Applicants

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EXPRESS MAIL No.:  
EV 626909934 US

UV-81

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicants : Joshua A. Rosenthol et al.  
Application No. : 09/262,658 Confirmation No. : 9736  
Filed : March 4, 1999  
For : PROGRAM GUIDE WITH USER DESIGNATED  
FAVORITE THEMES  
Art Unit : 2611  
Examiner : Jason P. Salce

Mailstop PETITION New York, New York 10020  
Commissioner for Patents March 4, 2005  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

PETITION UNDER 37 C.F.R. § 1.181  
TO WITHDRAW HOLDING OF ABANDONMENT

Applicants hereby petition under 37 C.F.R. § 1.181  
to withdraw the holding of Abandonment set forth in the  
Notice of Abandonment mailed on February 10, 2004 (copy  
attached at Exhibit A). In accordance with  
37 C.F.R. § 1.181, applicants make this Petition within two  
months of the mailing date of the Notice of Abandonment.

Statement of Facts

On July 13, 2004, an Office Action was mailed by the United States Patent and Trademark Office ("USPTO"). On January 13, 2005, applicants filed a Reply to the Office Action (copy attached at Exhibit B), a transmittal letter and a request for a three-month extension of time (copy attached at Exhibit C), Formal Drawings (copy attached at Exhibit D), a Supplemental Information Disclosure Statement (copy attached at Exhibit E), copies of 26 Foreign Patent Documents (attached at Exhibit F) and copies of 2 U.S. Patent Applications (attached at Exhibit G).

The enclosed copies of the return postcard, date stamped as received by the USPTO on January 13, 2005 (copy attached at Exhibit H), the Express Mail Certification (copy attached at Exhibit I), and the Express Mail Label, date stamped January 13, 2005 by the United States Post Office (copy attached at Exhibit J), demonstrate that the Reply was timely filed. (See 37 C.F.R. § 1.10 and MPEP §§ 503 and 711.03(c)(I)(B)).

On February 10, 2005, the Notice of Abandonment (see Exhibit A) was mailed by the USPTO stating that this application was abandoned because the Reply to the July 13, 2004 Office Action was not received. Applicants



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respectfully submit that the Notice of Abandonment was issued in error. Applicants respectfully request that the holding of abandonment be withdrawn.

The Reply was filed within six months of the mailing date of the Office Action. Applicants petitioned for a three-month extension of time and supplied a check in the amount of \$1020.00 to cover the extension of time fee. This check was cashed by the Patent Office on January 25, 2005 (copy attached at Exhibit K). Because the Reply was originally filed by Express Mail on January 13, 2005, as evidenced by the stamped Express Mail Label, and because applicants have already paid a three-month extension fee, as evidenced by the cashed \$1020.00 check, applicants believe that no extension fees are due in connection with the resubmission of this Reply.

Applicants respectfully request that the Reply be entered in the above-identified patent application, and that prosecution of the application resume its normal course.

With respect to the Supplemental Information Disclosure Statement (IDS), a fee in the amount of \$180.00 was due because this Statement was filed pursuant to 37 C.F.R. § 1.97(c)(2). Applicants submitted a check in

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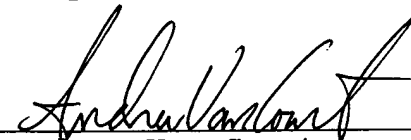
the amount of \$180.00 in connection with the filing of the Supplemental IDS. This check was cashed by the Patent Office on January 25, 2005 (copy attached in Exhibit L). Accordingly, applicants believe that no fee is due for consideration of the resubmitted Supplemental IDS in view of the earlier submission of the documents (as evidenced by the return postcard) and the fact that applicants have already paid the fee in consideration of this Supplemental IDS (as evidenced by the cashed \$180.00 check).

However, notwithstanding the foregoing, the Director is hereby authorized to charge any fee that may be due in connection with this Petition or resubmission of the Reply and Supplemental IDS to Deposit Account 06-1075. A duplicate copy of this Petition is enclosed herewith.

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An early and favorable action is respectfully  
requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Andrew Van Court", is written over a horizontal line.

Andrew Van Court  
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Agent for Applicants  
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EV 626909934 US

# EXHIBIT A



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/262,658	03/04/1999	JOSHUA A. ROSENTHOL	UV-81	9736

7590 02/10/2005  
WALTER M EGBERT III  
FISH AND NEAVE  
1251 AVENUE OF THE AMERICAS  
NEW YORK, NY 100201104

## RECEIVED

FEB 16 2005

EXAMINER

SALCE, JASON P

ART UNIT PAPER NUMBER

2611

DATE MAILED: 02/10/2005

RECEIVED - PLEASE INITIAL  
TO DOCUMENT TO INDICATE  
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ROPES & GRAY LLP - PATENT DEPT.  
REFERRED TO AKK  
NOTED BY AKK

Please find below and/or attached an Office communication concerning this application or proceeding.

# Notice of Abandonment

Application No.

09/262,658

Examiner

Jason P Salce

Applicant(s)

ROSENTHOL ET AL.

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 7/13/2005.
  - (a) ☐ A reply was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply (including a total extension of time of \_\_\_\_\_ month(s)) which expired on \_\_\_\_\_.
  - (b) ☐ A proposed reply was received on \_\_\_\_\_, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection.  
(A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
  - (c) ☐ A reply was received on \_\_\_\_\_ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
  - (d) ☒ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
  - (a) ☐ The issue fee and publication fee, if applicable, was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
  - (b) ☐ The submitted fee of \$\_\_\_\_\_ is insufficient. A balance of \$\_\_\_\_\_ is due.  
The issue fee required by 37 CFR 1.18 is \$\_\_\_\_\_. The publication fee, if required by 37 CFR 1.18(d), is \$\_\_\_\_\_.
  - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
  - (a) ☐ Proposed corrected drawings were received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply.
  - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on \_\_\_\_\_ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☒ The reason(s) below:  
  
An attempt was made to contact applicant's representative, but no reply was received.



CHRIS GRANT  
PRIMARY EXAMINER

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

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EV 626909934 US

# EXHIBIT B

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicants : Joshua Rosenthal et al.  
Application No. : 09/262,658 Confirmation No. : 9736  
Filed : March 4, 1999  
For : PROGRAM GUIDE SYSTEM WITH USER  
DESIGNATED FAVORITE THEMES  
Group Art Unit : 2611  
Examiner : Jason P. Salce

New York, New York 10020  
January 13, 2005

Hon. Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

REPLY TO OFFICE ACTION

Sir:

A three-month extension of time in which to respond to the Office Action dated July 13, 2004 for the above-identified patent application is respectfully requested. A check in the amount of \$1020.00 for a three-month extension of time is enclosed herewith. With the extension, a Reply to the outstanding Office Action is due on or before January 13, 2005.



In response to the July 13, 2004 Office Action, please  
amend the above-identified patent application as follows:

Amendments to the Drawings begin on page 3.

Amendments to the Specification begin on page 4.

Amendments to the Claims begin on page 8.

Remarks begin on page 37.

### **Amendment the Drawings**

Please approve the following amendment to FIG. 14 as indicated in red on the attached copy of the informal drawing for FIG. 14:

please change "114" to --115--.

Please approve the following amendment to FIG. 14 as indicated in red on the attached copy of the informal drawing for FIG. 14:

please delete number references 310 and 312.

Replacement sheets 1-16 are attached herewith for use as formal drawings.

Annotated sheets 7 and 13 are attached herewith in Appendix A to show the changes to the original sheets 7 and 13.

### Amendment to the Specification

Please amend the specification on page 19, line 31 through page 21, line 3 with the following amended version of that paragraph:

The user is provided the option of displaying the results of the search, i.e., the program listings that have the selected theme (see FIG. 2, step 44). A list of programming that has the selected theme is displayed according to one embodiment in FIG. 8(a). The listing 110 of programming is a by-time listing displayed by broadcast time 112 and by channel ~~115~~ 114. Only programming having the selected theme is displayed, whereas program listings which do not have the selected theme are suppressed from view. In the current example, only programming which has the theme "sports" is displayed. According to a second embodiment (FIG. 8(b)), listing 120 displays all available programming to the user by broadcast time 122 and by channel 124. Blocks 125 containing programming which has the desired theme is distinctively displayed to attract the user's attention. For example, each program may be represented in a particular color. In addition, an icon or label 126, e.g., "favorite" may be provided in the programming block 125. Continuing with the example, all programming is displayed, but only programming having the "sports" theme is specially highlighted or displayed. The

user may remain in the program listings mode (step 44) and make programming selections within this mode, as is known in the art. For example, the user may highlight a particular program to make a selection. While viewing listing 120, the user may quickly move the highlighted region between programs having the selected "favorite" theme and skip over all other programming. In one embodiment, by pressing a "FAV" key on the user remote 34, the viewer may advance the highlighted region from "NBA Basketball" on channel 6 directly to "College Football" on channel 9, while skipping channels 7-8. Alternatively, the user may be chose the option to select another theme (step 42), or to modify the themes list by designating another favorite (step 40).

Please amend the paragraph on page 26, line 22 through page 27, line 14 with the following amended version of that paragraph:

Theme selection screen 400 permits both the step of modifying the themes list (step 40) by designating and highlighting favorite themes and the step of designating the themes as search criteria (step 42). The user is provided with the option of selecting a theme by using the cursor keys 404 to scroll to the desired theme (FIG. 16). The user designates the highlighted theme as a favorite by pressing the Favorites button

on the user remote or by highlighting and selecting the FAV on-screen button 410. In contrast with the embodiments described above, the designated favorite theme does not change location on the themes list 401 but is represented in a particular color. The user may be prompted to select a color, or a default color may be selected by the program guide to assign to all selected favorite themes. This process of designating themes may be repeated as many times as desired. The modified themes list continues to display all themes during this process. However, themes designated as favorites would be displayed in the selected color, and themes that the user has not selected will continue to be represented in a neutral color, such as white or black. In FIG. 16, for example, the user has designated "comedy," "sports," and "drama" as favorite themes 402.

Please amend the paragraph on page 29, line 25 through page 30, line 4 with the following amended version of that paragraph:

The user's preferences with respect to favorite themes may change over time. The user may wish to change the selection of favorite themes that are displayed at screen 550 by for example, highlighting and selecting the up and down-cursor buttons 554 on screen 550. At step 80 (FIG. 10), the user is provided

with the option of retaining in memory the themes which were not selected at screen 500 and deleted from themes list 551. This process may alternatively be a default setting, such that the option is provided to the user during a set-up procedure, if at all. At step 82, the user may be provided with the option of restoring deleted themes to the themes list at screen 500.

### Amendment to the Claims

Please amend claims 1, 43, 67, 78, 104, and 110. This listing of claims will replace all prior versions, and listings, of this application.

#### Listing of Claims:

1. (currently amended) An interactive television program guide system in which an interactive television program guide is at least partially implemented on user equipment of a user, comprising:

means for displaying a list of programming themes;

means for providing an option with the interactive television program guide for the user to select a programming theme from the list of programming themes and a level of interest in that selected programming theme ~~which is indicative of the user's programming interests~~; and

means for modifying the list of programming themes based ~~upon~~ on the selected theme and level of interest.

2. (original) The interactive television program guide system defined in claim 1, wherein the means for providing the option for the user to select a programming theme and a level of interest in that programming theme comprises providing an option

for the user to designate a high level of interest in the selected programming theme.

3. (original) The interactive television program guide system defined in claim 2, wherein the means for modifying the list of programming themes comprises means for displaying the list of programming themes with the selected programming theme at the top of the list.

4. (original) The interactive television program guide system defined in claim 3, wherein the means for displaying the list of programming themes further comprises means for shifting the remaining programming themes to a lower position on the list.

5. (original) The interactive television program guide system defined in claim 1, further comprising:  
means for providing an option to select a programming theme from the list as a search criterion for searching program listings data.

6. (original) The interactive television program guide system defined in claim 5, further comprising:



means for searching the program listings data for programming satisfying the search criterion in a database maintained by the interactive television program guide.

7. (original) The interactive television program guide system defined in claim 6, wherein the interactive television program guide maintains the database on the user equipment.

8. (original) The interactive television program guide system defined in claim 6, further comprising:

a server located at a television distribution facility on which at least a portion of the interactive television program guide is implemented, wherein the interactive television program guide maintains the database on the server.

9. (original) The interactive television program guide system defined in claim 6, further comprising:

means for displaying a list of programming satisfying the search criterion.

10. (original) The interactive television program guide system defined in claim 1, wherein the means for providing the option for the user to select a programming theme and a level

of interest in that programming theme comprises providing an option to designate a low level of interest in the selected programming theme.

11. (original) The interactive television program guide system defined in claim 10, wherein the means for modifying the list of programming themes comprises means for displaying the list of programming themes with the selected programming theme at the bottom of the list.

12. (original) The interactive television program guide system defined in claim 10, wherein the means for modifying the list of programming themes comprises means for deleting the selected programming theme from the list of programming themes.

13. (original) The interactive television program guide system defined in claim 1, wherein the means for providing an option for the user to select a programming theme and a level of interest in that programming theme comprises means for numerically designating a position for the selected programming theme in the list of programming themes.

14. (original) The interactive television program guide system defined in claim 1, wherein the means for modifying the list of programming themes comprises means for displaying the selected programming theme in a predetermined color.

15. (original) The interactive television program guide system defined in claim 14, further comprising:

means for searching program listings data stored in a database maintained by the interactive television program guide while using the selected programming theme as a search criterion.

16. (original) The interactive television program guide system defined in claim 15, wherein the interactive television program guide maintains the database on the user equipment.

17. (original) The interactive television program guide system defined in claim 15, further comprising:

a server located at a television distribution facility on which at least a portion of the interactive television program guide is implemented, wherein the interactive television program guide maintains the database on the server.

18. (original) The interactive television program guide defined in claim 15, further comprising:

means for displaying a list of programming satisfying the search criterion.

19. (original) The interactive television program guide system defined in claim 1, further comprising:

means for storing the selected programming theme and level of interest.

20. (original) The interactive television program guide system defined in claim 1, wherein the user equipment is user personal computer equipment.

21. (original) The interactive television program guide system defined in claim 1, wherein the user equipment is user television equipment.

22. (original) The interactive television program guide system defined in claim 1, further comprising:

a server located at a television distribution facility on which at least a portion of the interactive television program guide is implemented.

23. (original) An interactive television program guide system in which an interactive television program guide is implemented on user equipment of a user, comprising:

means for providing an option with the interactive television program guide for the user to select a favorite programming theme from a list of programming themes; and

means for displaying the list of programming themes in which the favorite programming theme is reordered at the top of the list.

24. (original) The interactive television program guide system defined in claim 23, wherein the means for displaying the list of programming themes further comprises means for shifting the remaining programming themes in the list to a lower position on the list.

25. (original) The interactive television program guide system defined in claim 23, further comprising:

means for providing an option to select a programming theme from the list as a search criterion; and

means for searching programming listings data for programming satisfying the search criterion.

26. (original) The interactive television program guide system defined in claim 25, further comprising:

means for displaying a list of programming satisfying the search criterion.

27. (original) The interactive television program guide system defined in claim 23, further comprising:

means for storing the favorite programming theme in a non-volatile memory device.

28. (original) The interactive television program guide system defined in claim 23, wherein the user equipment is personal computer equipment.

29. (original) The interactive television program guide system defined in claim 23, wherein the user equipment is user television equipment.

30. (original) An interactive television program guide system in which an interactive television program guide is implemented on user equipment of a user, comprising:

means for providing an option with the interactive television program guide for the user to select a programming theme for which the user has a low level of interest from a list of programming themes; and

means for providing an option for displaying the list of programming themes having the selected programming theme at the bottom of the list of programming themes.

31. (original) The interactive television program guide system defined in claim 30, further comprising:

means for providing an option for deleting the selected programming theme from the list of programming themes.

32. (original) The interactive program guide system defined in claim 31, further comprising:

means for providing an option for restoring the deleted programming theme to the themes list.

33. (original) The interactive television program guide system defined in claim 30, further comprising:

means for storing the selected programming theme in a non-volatile memory device.

34. (original) The interactive television program guide system defined in claim 30, wherein the user equipment is personal computer equipment.

35. (original) The interactive television program guide system defined in claim 30, wherein the user equipment is user television equipment.

36. (original) An interactive television program guide system in which an interactive television program guide is implemented on user equipment of a user, comprising:

means for displaying a list of programming themes;

means for providing an option with the interactive television program guide for the user to select a plurality of favorite programming themes from the list of programming themes;

and

means for displaying the list of programming themes in which the selected favorite programming themes are distinctively displayed.

37. (original) The interactive television program guide system defined in claim 36, wherein the means for displaying



the list of programming themes comprises highlighting the favorite programming theme in a predetermined color.

38. (original) The interactive television program guide system defined in claim 36, further comprising:

means for searching programming listings data for programming having at least one of the selected programming themes.

39. (original) The interactive television program guide system defined in claim 37, further comprising:

means for displaying a list of programming having at least one of the selected programming themes.

40. (original) The interactive television program guide system defined in claim 36, further comprising:

means for storing the favorite programming themes in a non-volatile memory device.

41. (original) The interactive television program guide system defined in claim 36, wherein the user equipment is personal computer equipment.

42. (original) The interactive television program guide system defined in claim 36, wherein the user equipment is user television equipment.

43. (currently amended) An interactive television program guide system in which an interactive program guide is at least partially implemented on user equipment of a user, comprising:

means for displaying a list of programming themes;

means for providing an option with the interactive television program guide for the user to select a programming theme from the list of programming themes and a level of interest in that selected programming theme ~~which is indicative of the user's programming interest~~; and

means for providing an option for creating a preference profile with which the selected programming theme and level of interest are associated.

44. (original) The interactive television program guide system defined in claim 43, wherein there are multiple profiles, the system further comprising means for providing an option of selecting which of the profiles to make active.

45. (original) The interactive television program guide system defined in claim 43, further comprising:

means for modifying the list of programming themes based upon the selected programming theme and level of interest.

46. (original) The interactive television program guide system defined in claim 43, wherein the means for providing an option for the user to select a programming theme and a level of interest in that programming theme comprises providing an option for the user to designate a high level of interest in the selected programming theme.

47. (original) The interactive television program guide system defined in claim 44, wherein the means for modifying the list of programming themes comprises means for displaying the list of programming themes with the selected programming theme at the top of the list.

48. (original) The interactive television program guide system defined in claim 45, wherein the means for displaying the list of programming themes further comprises means for shifting the remaining programming themes to a lower position on the list.

49. (original) The interactive television program guide system defined in claim 43, further comprising:

means for providing an option to select a programming theme from the list as a search criterion for searching program listings data.

50. (original) The interactive television program guide system defined in claim 47, further comprising:

means for searching the program listings data for programming satisfying the search criterion in a database maintained by the interactive television program guide.

51. (original) The interactive television program guide system defined in claim 48, wherein the interactive television program guide maintains the database on the user equipment.

52. (original) The interactive television program guide system defined in claim 48, further comprising:

a server located at a television distribution facility on which at least a portion of the interactive television

program guide is implemented, wherein the interactive television program guide maintains the database on the server.

53. (original) The interactive television program guide system defined in claim 48, further comprising:

means for displaying a list of programming satisfying the search criterion.

54. (original) The interactive television program guide system defined in claim 43, wherein the means for providing an option for the user to select a programming theme and a level of interest in that programming theme comprises providing an option to designate a low level of interest in the selected programming theme.

55. (original) The interactive television program guide system defined in claim 52, wherein the means for modifying the list of programming themes comprises displaying the list of programming themes with the selected programming theme at the bottom of the list.

56. (original) The interactive television program guide system defined in claim 52, wherein the means for modifying

the list of programming themes comprises means for deleting the selected programming theme from the list of programming themes.

57. (original) The interactive television program guide system defined in claim 43, wherein the means for providing an option for the user to select a programming theme and a level of interest in that programming theme comprises means for numerically designating a position for the selected programming theme in the list of programming themes.

58. (original) The interactive television program guide system defined in claim 43, wherein the means for modifying the list of programming themes comprises means for displaying the selected programming theme in a predetermined color.

59. (original) The interactive television program guide system defined in claim 56, further comprising:

means for searching program listings data stored in a database maintained by the interactive television program guide while using the selected programming theme as a search criterion.

60. (original) The interactive television program guide system defined in claim 57, wherein the interactive

television program guide maintains the database on the user equipment.

61. (original) The interactive television program guide system defined in claim 57, further comprising:

a server located at a television distribution facility on which at least a portion of the interactive television program guide is implemented, wherein the interactive television program guide maintains the database on the server.

62. (original) The interactive television program guide defined in claim 57, further comprising:

means for displaying a list of programming satisfying the search criterion.

63. (original) The interactive television program guide system defined in claim 43, further comprising:

means for storing the selected programming theme and level of interest.

64. (original) The interactive television program guide system defined in claim 43, wherein the user equipment is user personal computer equipment.

65. (original) The interactive television program guide system defined in claim 43, wherein the user equipment is user television equipment.

66. (original) The interactive television program guide system defined in claim 43, further comprising:

a server located at a television distribution facility on which at least a portion of the interactive television program guide is implemented.

67. (currently amended) An interactive television program guide system in which an interactive television program guide is at least partially implemented on user equipment of a user, comprising:

means for displaying a first list of programming themes;

means for providing an option with the interactive television program guide for the user to select a programming theme from the first list of programming themes and a level of interest in that selected programming theme ~~which is indicative of the user's programming interests~~; and



means for displaying a second list of programming themes based upon on the selected programming theme and level of interest.

68. (original) The interactive television program guide system defined in claim 67, wherein the second list of programming themes displays only the selected programming themes.

69. (original) The interactive television program guide system defined in claim 67, wherein the means for providing an option for the user to select a programming theme and a level of interest in that programming theme comprises means for providing an option for the user to designate a high level of interest in the selected programming theme.

70. (original) The interactive television program guide system defined in claim 67, further comprising:

means for providing an option to select a programming theme from the second list as a search criterion for searching program listings data.

71. (original) The interactive television program guide system defined in claim 70, further comprising:

means for searching the program listings data for programming satisfying the search criterion in a database maintained by the interactive television program guide.

72. (original) The interactive television program guide system defined in claim 71, wherein the interactive television program guide maintains the database on the user equipment.

73. (original) The interactive television program guide system defined in claim 71, further comprising:

a server located at a television distribution facility on which at least a portion of the interactive television program guide is implemented, wherein the interactive television program guide maintains the database on the server.

74. (original) The interactive television program guide system defined in claim 71, further comprising:

means for displaying a list of programming satisfying the search criterion.

75. (original) The interactive television program guide system defined in claim 67, further comprising:

means for storing the selected programming theme and level of interest.

76. (original) The interactive television program guide system defined in claim 67, wherein the user equipment is user personal computer equipment.

77. (original) The interactive television program guide system defined in claim 67, wherein the user equipment is user television equipment.

78. (currently amended) A method for using an interactive television program guide system in which an interactive television program guide is at least partially implemented on user equipment of a user, comprising:

displaying a list of programming themes;

providing an option with the interactive program guide system for the user to select a programming theme from the list of programming themes and a level of interest in that selected programming theme ~~which is indicative of the user's programming interests~~; and

modifying the list of programming themes based on the selected programming theme and level of interest.

79. (original) The method defined in claim 78 wherein the step of providing an option for the user to select a programming theme from the list of programming themes and a level of interest in that programming theme comprises designating a high level of interest in the selected programming theme.

80. (original) The method defined in claim 79 wherein the step of modifying the list of programming themes comprises reordering the favorite programming theme at the top of the list of programming themes.

81. (original) The method defined in claim 80 wherein the step of modifying the list of programming themes further comprises shifting the remaining programming themes to a lower position on the list.

82. (original) The method defined in claim 79, further comprising:

providing an option to select a programming theme from the list as a search criterion for searching program listings data.

83. (original) The method defined in claim 82, further comprising:

searching the program listings data for programming satisfying the search criterion in a database maintained by the interactive television program guide.

84. (original) The method defined in claim 83, further comprising:

maintaining the database on user equipment.

85. (original) The method defined in claim 83, further comprising:

providing a server located at a television distribution facility on which at least a portion of the interactive television program guide is implemented; and  
maintaining the database on the server.

86. (original) The method defined in claim 83, further comprising:

displaying a list of programming satisfying the search criterion.

87. (original) The method defined in claim 78, wherein the step of providing an option for the user to select a programming theme and a level of interest in that programming theme comprises providing an option to designate a low level of interest in the selected programming theme.

88. (original) The method defined in claim 87, wherein the step of modifying the list of programming themes comprises displaying the list of programming themes with the selected programming theme at the bottom of the list.

89. (original) The method defined in claim 87, wherein the step of modifying the list of programming themes comprises deleting the selected programming theme from the list of programming themes.

90. (original) The method defined in claim 78, wherein the means for providing an option for the user to select a programming theme and a level of interest in that programming theme comprises numerically designating the position of the selected programming theme in the list of programming themes.

91. (original) The method defined in claim 78, wherein the means for modifying the list of programming themes comprises means for displaying the selected programming theme in a predetermined color.

92. (original) The method defined in claim 91, further comprising:

searching program listings data stored in a database maintained by the interactive television program guide while using the selected programming theme as a search criterion.

93. (original) The method defined in claim 92, further comprising:

maintaining the database on the user equipment.

94. (original) The method defined in claim 92, further comprising:

providing a server located at a television distribution facility on which at least a portion of the interactive television program guide is implemented,; and  
maintaining the database on the server.

95. The method defined in claim 92, further comprising:

displaying a list of programming satisfying the search criterion.

96. (original) The method defined in claim 78, further comprising:

storing the selected programming theme and level of interest.

97. (original) The method defined in claim 78, further comprising:

providing a server located at a television distribution facility; and

implementing at least a portion of the interactive television program guide on the server.

98. (original) The method defined in claim 78, wherein the step of providing an option for the user to select a programming theme from the list of programming themes and a level of interest in that programming theme comprises designating a plurality of favorite programming themes from the list of programming themes.



99. (original) The interactive television program guide system defined in claim 98, wherein the step of modifying the list of programming themes comprises highlighting the favorite programming theme in a predetermined color.

100. (original) The method defined in claim 98, further comprising:  
searching programming listings data for programming having at least one of the selected programming themes.

101. (original) The method defined in claim 100, further comprising:  
displaying a list of programming having at least one of the selected programming themes.

102. (original) The method defined in claim 78, further comprising:  
providing an option for creating a preference profile with which the selected programming theme and the respective level of interest are associated.

103. (original) The method defined in claim 102, wherein there are multiple profiles, the method further comprising:

providing an option of selecting which of the profiles to make active.

104. (currently amended) A method for using an interactive television program guide system in which an interactive television program guide is at least partially implemented on user equipment of a user, comprising:

displaying a first list of programming themes;

providing an option with the interactive television program guide for the user to select a programming theme from the first list of programming themes and a level of interest in that selected programming theme ~~which is indicative of the user's programming interests~~; and

displaying a second list of programming themes based ~~upon~~ on the selected programming theme and level of interest.

105. (original) The method defined in claim 104, wherein the step of displaying a second list of programming themes comprises displaying only the selected programming themes.

106. (original) The method defined in claim 104, wherein the means for providing an option for the user to select a programming theme and a level of interest in that programming theme comprises providing an option for the user to designate a high level of interest in the selected programming theme.

107. (original) The method defined in claim 104, further comprising:

providing an option to select a programming theme from the second list as a search criterion for searching program listings data.

108. (original) The method defined in claim 107, further comprising:

searching the program listings data for programming satisfying the search criterion in a database maintained by the interactive television program guide.

109. (original) The method defined in claim 108, further comprising:

maintaining the database on the user equipment.

110. (currently amended) The method defined in claim 108, further comprising:

providing a server located at a television distribution facility on which at least a portion of the interactive television program guide is implemented, wherein the interactive television program guide maintains the database on the server.

111. (original) The method defined in claim 108, further comprising:

displaying a list of programming satisfying the search criterion.

112. (original) The method defined in claim 104, further comprising:

storing the selected programming theme and level of interest.

113. (original) The method defined in claim 104 further comprising:

providing a server located at a television distribution facility; and

implementing at least a portion of the interactive .  
television program guide on the server.

## Remarks

### I. Summary of the Office Action

Claims 1-113 are pending in this case.

The drawings are objected to for failing to comply with 37 C.F.R. § 1.84(p)(5) for including reference numbers not mentioned in the specification.

Claims 1, 2, 5-7, 9, 10, 12-16, 18, 21, 26-29, 36-42, 67-72, 74-79, 82-84, 86, 87, 91-93, 95, 99, 100, 106-109, and 111 are rejected under 35 U.S.C. § 102(b) as being anticipated by Young et al. U.S. Patent 5,353,121 (hereinafter "Young").

Claims 3, 4, 8, 11, 13, 17, 19, 20, 22-25, 30-35, 43-66, 73, 80, 81, 85, 88-90, 94, 96-98, 101-103, 105, 110, 112, and 113 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Young in view of Shah-Nazaroff et al. U.S. Patent 6,317,881 (hereinafter Shah-Nazaroff).

### II. Summary of Applicants' Reply

Applicants have proposed amendments to the drawings and the specification. Formal drawings are submitted herewith in anticipation of the approval of the proposed amendments.

Applicants have amended claims 1, 43, 67, 78, and 104 to more particularly defined the claimed inventions. The amendments to the claims are fully supported and do not introduce any new matter.

Applicants respectfully traverse each rejection.

III. Objection to the Drawings  
and Submission of Formal Drawings

The drawings are objected to for failing to comply with 37 C.F.R. § 1.84(p)(5) for including reference numbers not mentioned in the specification. The missing reference numbers include 114, 310, 312, 401, 402, 404, and 554. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference numbers is required.

A. Amendment to the Drawings and the Specification

Applicants have proposed an amendment to FIGS. 8A and 14 and the specification to correct minor mistakes pertaining to missing reference numbers 114, 310, 312, 401, 402, 404, and 554. No new matter would be added by the proposed amendments to the drawing or specification.

Accordingly, applicants respectfully request approval of the amendments to the drawings and the specification.

B. Submission of Formal Drawings

In anticipation of the approval of the aforementioned drawing amendment, applicants herewith furnish sixteen (16) sheets of formal drawings, incorporating the aforementioned amendment, to be substituted for the sixteen (16) sheets of informal drawings filed with the application.

IV.        The § 102 Rejections

Claims 1, 2, 5-7, 9, 10, 12-16, 18, 21, 26-29, 36-42, 67-72, 74-79, 82-84, 86, 87, 91-93, 95, 99, 100, 106-109, and 111 are rejected under 35 U.S.C. § 102(b) as being anticipated by Young. Applicants respectfully traverse this rejection.

A.        Independent Claims 1 and 78

Applicants' amended independent claims 1 and 78 refer to an interactive television program guide system and method in which an interactive television program guide is at least partially implemented on user equipment. Applicants' system and method, as defined by independent claims 1 and 78, are not anticipated nor rendered obvious by Young because applicants' claimed invention provides an option for a user to select a programming theme from a list of programming themes and a level of interest in that programming theme and the claimed invention modifies the list of programming themes based on the selected theme and its selected level of interest. For example, applicants' system enables a user to designate which themes are preferred or not preferred and displays those themes based on the user's designated interest in those themes. Applicants' FIG. 4 illustrates a selection of a theme and a level of interest in that theme. In FIG. 4, step 46 shows the option of selecting a theme (such as a theme from a list of themes 101 in FIG. 3), step 48 shows designating that theme as



a "favorite", and steps 50 and 52 show modifying the list of themes based on the designation of that theme.

In Young, in contrast, "[a] theme function is provided to allow the user to quickly sort a downloaded schedule [(e.g., a program listings schedule)] and display a subset schedule based on a subject of interest" (column 14, lines 48-50). "The user has the freedom to select listings sorted first by major themes, second by topic(s) within a theme, and/or by topic qualifiers" (Young, column 15, lines 50-52). This theme function is for further refining a schedule of listings, such as program listings, based on user selected criteria, not for modifying a list of programming themes based on indicated level of interest. Thus, a difference between applicants' claimed invention and Young is the selection of a level for selected programming themes. In particular, the selection of a level of interest for a selected programming theme provides a basis for modifying the themes in the list of programming themes, as specified in claims 1 and 78, not for further defining a subset of a schedule to be displayed, as disclosed in Young.

In fact, each theme 106 includes a group of search attributes or qualifiers 112. These qualifiers 112 function as additional criteria for determining which television program listings are displayed, not a means for selecting a level of

interest in a particular theme nor for modifying the list of programming themes based the selected interest. For example, the qualifier field of FIG. 14 includes four star \*\*\*\*, three star \*\*\*, two star \*\*, and one star \* rated TV programs, and when a user selects both the \*\*\*\* and \*\*\* boxes, only programs that have at least the three star rating will be listed (Young, column 15, lines 40-45).

Accordingly, because Young does not show providing an option for a user to select a programming theme from a list of programming themes and a level of interest in that programming theme and modifying the list of programming themes based on the selected theme and their selected level of interest, as set forth in applicants' claims 1 and 78, claims 1 and 78 are not anticipated by Young and the rejection should be withdrawn. In addition, dependent claims 2, 5-7, 9, 10, 12-16, 18, 21, 79, 82-84, 86, 87, 89, 91-93, 95, 99, and 100 are allowable for at least the reason they depend from independent claims 1 or 78. Accordingly, the Examiner's rejection with respect to these claims are moot, and the rejection of these claims should be withdrawn.

B. Independent Claim 36

Applicants' independent claim 36 refers to an interactive television program guide system in which an interactive television program guide is implemented on user

equipment. Applicants' system, as defined by independent claim 36, is not anticipated nor rendered obvious by Young because applicants' system provides an option for a user to select a plurality of favorite programming themes from a list of programming themes and displays the list of programming themes in which the selected programming themes are distinctively displayed. In applicants' claimed invention, a favorite programming theme is displayed distinctly (e.g., in a specific color) to set it apart from non-favorite or other programming themes. For example, as described in applicants' specification, "themes designated as favorites would be displayed in the selected color, and themes that the user has not selected will continue to be represented in a neutral color, such as white or black" (page 27, lines 14-17).

In Young, in contrast, and as discussed above in Section III.A, a theme function is provided to allow the user to quickly sort a schedule (e.g., a program listings schedule) and display a subset schedule based on a subject of interest. A user can select themes, topics within a theme and qualifiers to define the subject of interest (e.g., the particular television programming listings to be displayed). The ability to select themes, topics, and/or qualifiers has nothing to do with selecting which programming themes are favorites. Nor does the display of a

schedule based on the selected themes, topics, and/or qualifiers have anything to do with distinctly displaying programming themes.

Accordingly, because Young does not show providing an option for a user to select a plurality of favorite programming themes from the list of programming themes and displaying the list of programming themes in which the selected programming themes are distinctively displayed, as set forth in applicants' claim 36, claim 36 is not anticipated by Young and the rejection should be withdrawn. In addition, dependent claims 37-42 are allowable for at least the reason they depend from independent claim 36, which is allowable. Accordingly, the Examiner's rejection with respect to these claims are moot, and the rejection of these claims should be withdrawn.

C. Independent Claims 67 and 104

Applicants' amended independent claims 67 and 104 are directed to an interactive television program guide system and method in which an interactive television program guide is at least partially implemented. Claims 67 and 104 are not anticipated by nor rendered obvious by Young because applicants' system and method displays a first list of programming themes, providing an option for the user to select a programming theme from the first list of programming themes and a level of interest in that selected programming theme, and displaying a second list

of programming themes based on the selected programming theme and level of interest.

In Young, in contrast, and as discussed above in Section III.A, a theme function is provided to allow the user to quickly sort a schedule (e.g., a program listings schedule) and display a subset schedule based on a subject of interest. However, this theme function is for further refining a schedule of listings, such as program listings, based on user selected criteria. Thus, a difference between applicants' claimed invention and Young is the selection of a level for selected programming themes. In particular, the selection of a level of interest for a selected programming theme provides a basis for "arranging" the themes in a second list of programming themes, as specified in claims 67 and 104 not for further defining a subset of a schedule to be displayed.

Accordingly, because Young does not show displaying a first list of programming themes, providing an option for the user to select a programming theme from the first list of programming themes and a level of interest in that selected programming theme, and displaying a second list of programming themes based on the selected programming theme and level of interest, as set forth in applicants' claims 67 and 104, claims 67 and 104 are not anticipated by Young and the rejection should be withdrawn. In

addition, dependent claims 68-72, 74-77, 106-109, and 111 are allowable for at least the reason they depend from independent claims 67 or 104. Accordingly, the Examiner's rejection with respect to these claims are moot, and the rejection of these claims should be withdrawn.

V. The § 103 Rejections

Claims 3, 4, 8, 11, 13, 17, 19, 20, 22-25, 30-35, 43-66, 73, 80, 81, 85, 88-90, 94, 96-98, 101-103, 105, 110, 112, and 113 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Young in view of Shah-Nazaroff. Applicants respectfully traverse this rejection.

A. Claims 3, 4, 8, 11, 13, 17, 19, 20, 22, 73, 80, 81, 85, 88-90, 94, 96-98, 101-103, 105, 110, 112, and 113

Claims 3, 4, 8, 11, 13, 17, 19, 20, 22, 73, 80, 81, 85, 88-90, 94, 96-98, 101-103, 105, 110, 112, and 113 are allowable for at least the reason they depend from one of independent claims 1, 36, 67, 78, and 104.

B. Ineligible Use of a Reference as Prior Art

According to MPEP § 702.02:

If the application properly claims benefit under 35 U.S.C. § 119(e) to a provisional application, the effective filing date is the filing date of the provisional application for any claims which are fully supported under the first paragraph of 35 U.S.C. 112 by the provisional application.

Applicants' application was filed March 3, 1999, but claims the benefit of U.S. provisional application No. 60/089,730, filed June 18, 1998 (hereinafter "the provisional application"). The provisional application is attached to Appendix B. Thus, applicants' effective filing date is June 18, 1999. Shah-Nazaroff's effective filing date is November 4, 1998. Applicants' effective filing date is before the effective filing date of Shah-Nazaroff, therefore Shah-Nazaroff is not prior art to at least one of applicants' claims 1-113.

With respect to independent claim 23, support for this claim can be found at lines 17-21 of the provisional application. Accordingly, for at least the reason that independent claim 23 is fully supported by the provisional application, the rejection of claim 23 and its dependent claims 24-29 should be withdrawn.

With respect to independent claim 30, support for this claim can be found at lines 23-30 of the provisional application. Accordingly, for at least the reason that independent claim 30 is fully supported by the provisional application, the rejection of claim 30 and its dependent claims 31-35 should be withdrawn.

C. Independent Claims 23, 30, and 43

Independent claims 23 and 30 and amended independent claim 43 are directed to interactive television program guide systems in which an interactive program guide is at least

partially implemented on user equipment. Even if Young and Shah-Nazaroff could be combined, claims 23, 30, and 43 would not anticipated by nor rendered obvious by such a combination because applicants' systems permit a user to select a theme, indicate a level of interest (e.g., a high level of interest such as a favorite or a low level of interest) in that theme, and the system performs an action (e.g., display a modified list of programming themes or stores the user's indicated interest in the selected theme in a preference profile) based on the user's interest in the selected themes. The novelty and non-obviousness of applicants' claims 23, 30, and 43 is apparent for several reasons.

First, in Young, as discussed above in Section III.A, a theme function is provided to allow the user to quickly sort a schedule (e.g., a program listings schedule) and display a subset schedule based on a subject of interest. However, this theme function is for further refining a schedule of listings, such as program listings, based on user selected criteria, not for modifying or storing a list of themes. Thus, the combination of Young and Shah-Nazaroff does not show "means for providing an option with the interactive television program guide for the user to select a favorite programming theme from a list of programming themes," as specified in independent claim 23. Nor does the combination of Young and Shah-Nazaroff show "means for providing



an option with the interactive television program guide for the user to select a programming theme for which the user has a low level of interest from a list of programming themes," as specified in independent claim 30. Moreover, the combination of Young and Shah-Nazaroff does not show "means for providing an option with the interactive television program guide for the user to select a programming theme from the list of programming themes and a level of interest in that selected programming theme," as specified in independent claim 43.

According, for at least the reason that the combination of Young and Shah-Nazaroff does not show or suggest each of applicants' claimed features in independent claims 23, 30, and 43, applicants respectfully request the rejection of these claims be withdrawn. In addition, applicants respectfully submit that the rejection of dependent claims 24-29, 31-35, and 44-66 because they depend from independent claims 23, 30, and 43.

Second, in Shah-Nazaroff, a rating for a broadcast (e.g., television show) is generated at least in part on collected viewer feedback information. (Column 2, lines 1-5 and FIG. 2) The rating of a particular broadcast may be provided to the user based on viewer characteristic information. (Column 5, lines 8-11) For example, FIG. 7 shows the rating of a show that was retrieved based on viewer characteristics. As shown, the search

results for a show entitled "The Great Adventures of Mighty Sloth" and the rating information for this show is displayed based on user selected several movie genres and entered age. A difference between applicants' claims 23, 30, and 43 and Shah-Nazaroff is in the list being displayed or modified. Applicants' claims 23, 30, and 43 specify selecting a theme and some level of interest in that theme so that the list of themes themselves are modified, displayed, or stored in a user profile according to the user's interest in those themes, not selecting a theme to see which broadcasts are ranked the highest in the selected theme (column 5, lines 41-47).

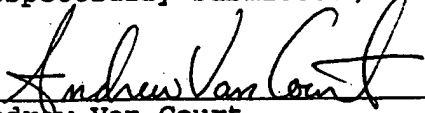
Moreover, program listings, broadcasts, or a ranking of such program listings or broadcast are not the same as themes, as contended by the Examiner (page 6, lines 4-6). As specified in applicants' specification, themes include categories or genres such as, for example, sports, movies, comedy, drama, children, etc. (Applicants' specification, page 9, lines 14-30 and page 13, line 32 through page 14, line 3). The Examiner contends that a program listing such as SportsCenter is a sports theme. This is not so. SportsCenter is merely an example of a program listing that may be displayed if, for example, a user selected a sports theme in a television program guide.

Accordingly, for at least the reason that Shah-Nazaroff fails to show or suggest (a) "displaying the list of programming themes in which the favorite programming theme is reordered at the top of the list," as specified in independent claim 23, (b) "providing an option for displaying the list of programming themes having the selected programming theme at the bottom of the list of programming themes," as specified in independent claim 30, and (c) "providing an option for creating a preference profile with which the selected programming theme and level of interest are associated, as specified in independent claim 43, applicants respectfully request that the rejection of independent claims 23, 30, and 47 be withdrawn. In addition, applicants respectfully submit that the rejection of dependent claims 24-29, 31-35, and 44-66 because they depend from independent claims 23, 30, and 43.

VI. Conclusion

The foregoing demonstrates that claims 1-113 are allowable. Applicants respectfully submit that this patent application is in condition for allowance. Reconsideration and allowance are respectfully requested.

Respectfully submitted,

  
\_\_\_\_\_  
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# Appendix A

04/01  
7/16

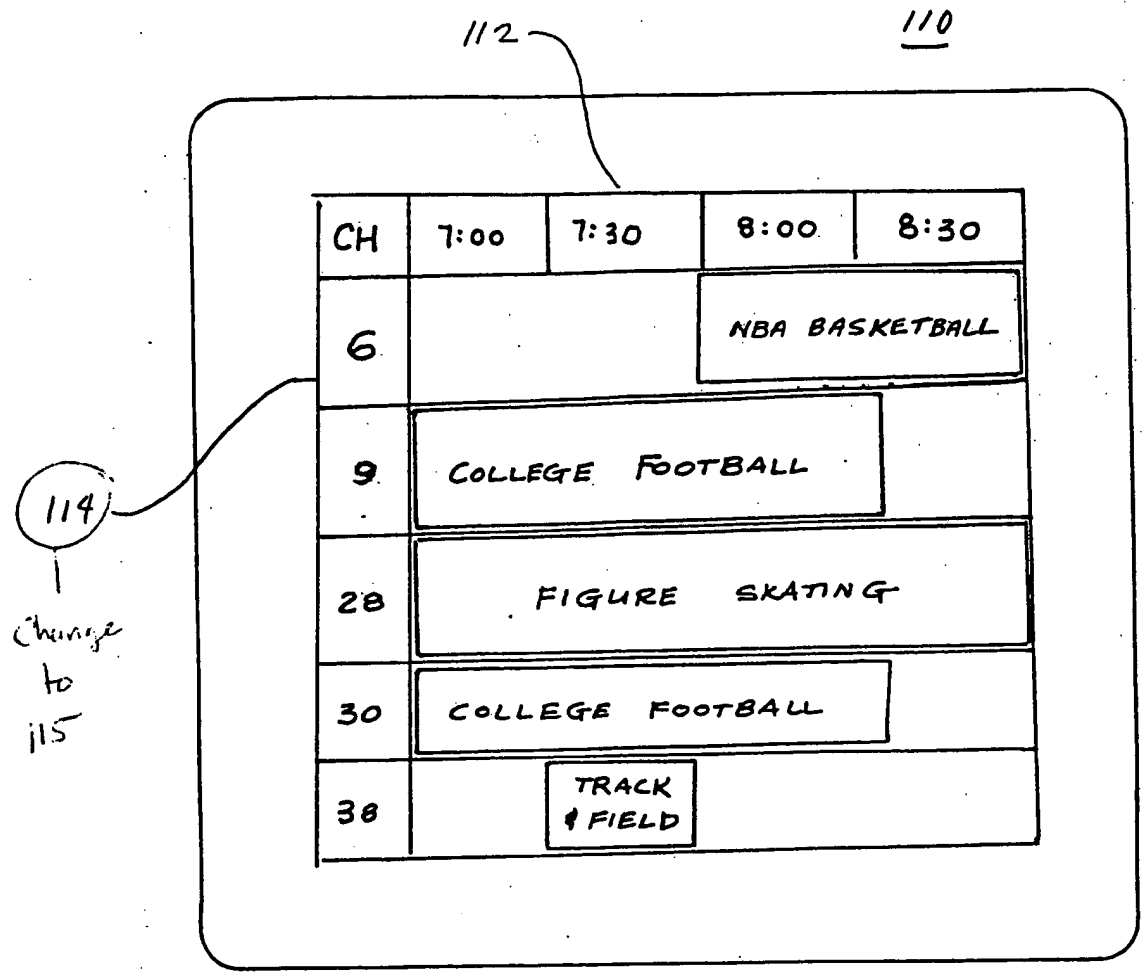


FIG. 8(a)

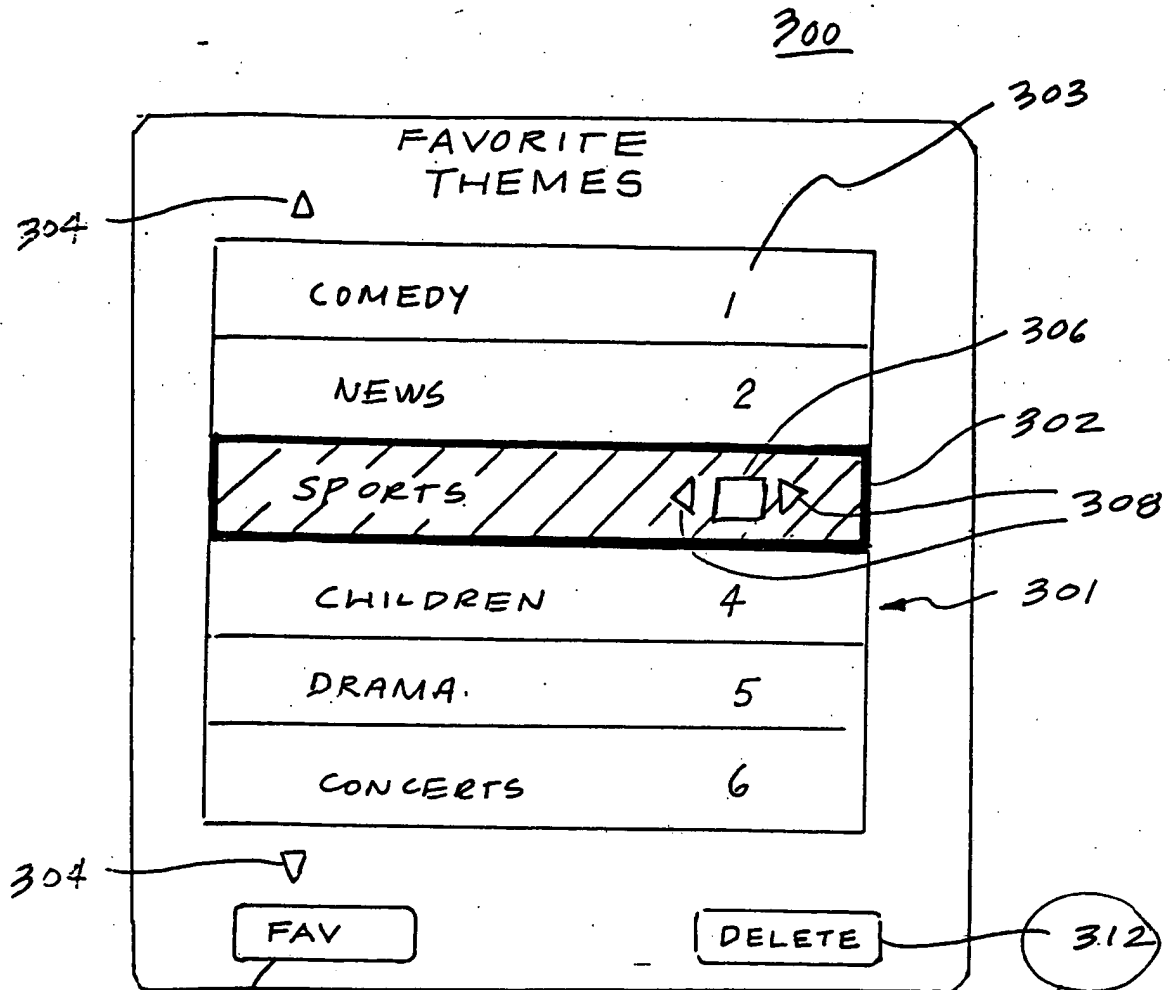


FIG. 14

DELETE

DELETE

## Appendix B



### Electronic Program Guide with Favorite Themes

Many electronic program guides support multiple theme selections. It is desirable to have as many themes as possible, making it more likely that a viewer's interests will be matched. However, the list of themes can be quite long, making it quite unwieldy for a user to find the desired programs.

Some program guides solve this problem by having hierarchical categories. First a viewer selects a high level category, then selects one or more subcategories. Although this allows navigation through a large number of categories, it can be quite cumbersome. It may not be obvious to the viewer which category will lead to a desired subcategory. It is not obvious what subcategories may be present. Some subcategories may be applicable to multiple categories. More keystrokes may be required. And the viewer may end up going through several levels of menus and discover that there are no programs available in the selected category.

This invention solves these problems by allowing the viewer to have favorite themes.

In one embodiment, when the viewer enters the theme selection screen, any individual theme may be selected, for example with the OK or SELECT key on the remote control. When this happens, the guide will display a list of programs with the desired theme. The FAVORITE key is also active on the theme selection screen. Pressing the FAVORITE key while any theme is highlighted will move that theme to the top of the list. It will remain in that position every time this screen is displayed, until another theme is made favorite, in which case the previous favorite and all other themes will move down one position. Preferably, the sort order should be stored in non-volatile memory, so that the order will be remembered after power is cycled.

In another embodiment, there is a DELETE key on the remote control. Pressing the DELETE key while any theme is highlighted will either move it to the bottom of the list, or will remove it from the list altogether.

In a third embodiment, there is a separate screen for selecting favorite themes. The FAVORITE and/or the DELETE key will change the sort order of the themes. Alternatively, an on-screen button could be used to select the sort order, after the viewer highlights a theme and presses SELECT or OK. The order selected on this screen would be reflected on the theme selection screen.

In a fourth embodiment, there is one screen on which the favorite themes may be selected. The viewer may select a theme as a favorite, for example by pressing a FAVORITE key on the remote control. The guide will indicate favorite themes, for example by showing them in a different color. A separate screen will list all programming that fits in any of the selected favorite themes.

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# EXHIBIT C

Rev. 12/04  
Modified PTO 1083  
For Other Than A Small Entity

PATENTS  
Attorney Docket No. UV-81

Applicants : Joshua Rosenthal et al.  
Application No.: 09/262,658 Confirmation No.: 9736  
Filed : March 4, 1999  
For : PROGRAM GUIDE SYSTEM WITH USER  
DESIGNATED FAVORITE THEMES  
Group Art Unit : 2611  
Examiner : Jason P. Salce  
Mail Stop Amendment  
Hon. Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

TRANSMITTAL LETTER

Sir:

Transmitted herewith: ☐ a Preliminary Amendment;  
☒ a Reply to Office Action; ☒ a Formal Drawings (sheets 1-16); ☐ a  
substitute Specification; ☒ a Supplemental Information Disclosure Statement;  
☒ PTO 1449-Form (in duplicate) to be filed in the above-identified patent  
application.

FEE FOR ADDITIONAL CLAIMS AND/OR PAGES

☒ A fee for additional claims or pages is not required.

☐ A fee for additional claims is required.

The additional fee has been calculated as shown below:

	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDITIONAL
TOTAL CLAIMS	-	*	= 0	x \$50	= \$ .00
INDEPENDENT CLAIMS	-	**	= 0	x \$200	= \$ .00
FIRST PRESENTATION OF A MULTIPLE DEPENDENT CLAIM				+ \$360	= \$ .00
* If less than 20, insert 20. ** If less than 3, insert 3.				TOTAL	\$ .00

- ☐ As a result of the amendment submitted herewith, this application now includes excess pages beyond those previously paid for. The number of additional groups of 50 excess pages resulting from this amendment is \_\_\_\_\_ x \$250 = \$ \_\_\_\_\_.
- ☐ A check in the amount of \$ \_\_\_\_\_ in payment of the fee for additional claims and/or pages is transmitted herewith.
- ☒ The Director is hereby authorized to charge payment of any additional fees required under 37 C.F.R. § 1.16 in connection with the paper(s) transmitted herewith, or credit any overpayment of same, to Deposit Account No. 06-1075. A duplicate copy of this transmittal letter is transmitted herewith.
- ☐ Please charge \$ \_\_\_\_\_ to Deposit Account No. 06-1075 in payment of the fee for additional claims. A duplicate copy of this transmittal letter is transmitted herewith.

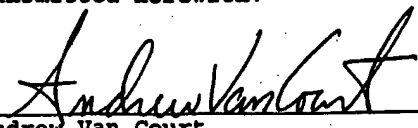
**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

- ☒ In accordance with 37 C.F.R. § 1.97(c)(2), applicants enclose a check in the amount of \$180.00 in payment of the fee for submission of the enclosed Supplemental Information Disclosure Statement, which is being submitted before the mailing date any of a Final Office Action, a Notice of Allowance, or an Office Action that otherwise closes prosecution.
- ☒ The Director is hereby authorized to charge payment of any additional fees required in connection with this Statement, or credit any overpayment of the same, to Deposit Account No. 06-1075. A duplicate copy of this transmittal letter is transmitted herewith.

**EXTENSION FEE**

- ☒ The following extension fee is applicable to the Response filed herewith:  
☐ \$120.00 extension fee for response within first month pursuant to 37 C.F.R. § 1.136(a); ☐ \$450.00 extension fee for response within second month pursuant to 37 C.F.R. § 1.136(a); ☒ \$1,020.00 extension fee for response within third month pursuant to 37 C.F.R. § 1.136(a); ☐ \$1,590.00 extension fee for response within fourth month pursuant to 37 C.F.R. § 1.136(a); ☐ \$2,160.00 extension fee for response within fifth month pursuant to 37 C.F.R. § 1.136(a).
- ☒ A check in the amount of ☐ \$120.00 ☐ \$450.00 ☒ \$1,020.00 ☐ \$1,590.00 ☐ \$2,160.00 in payment of the extension fee is transmitted herewith.
- ☒ The Director is hereby authorized to charge payment of any additional extension fees required under 37 C.F.R. § 1.17 in connection with the paper(s) transmitted herewith, or credit any overpayment of same, to Deposit Account No. 06-1075. A duplicate copy of this transmittal letter is transmitted herewith.

[ ] Please charge the [ ] \$120.00 [ ] \$450.00 [ ] \$1,020.00 [ ] \$1,590.00  
[ ] \$2,160.00 extension fee to Deposit Account No. 06-1075. A duplicate  
copy of this transmittal letter is transmitted herewith.



Andrew Van Court  
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Fax: (212) 596-9090

EXPRESS MAIL No.:  
EV 626909934 US

# EXHIBIT D

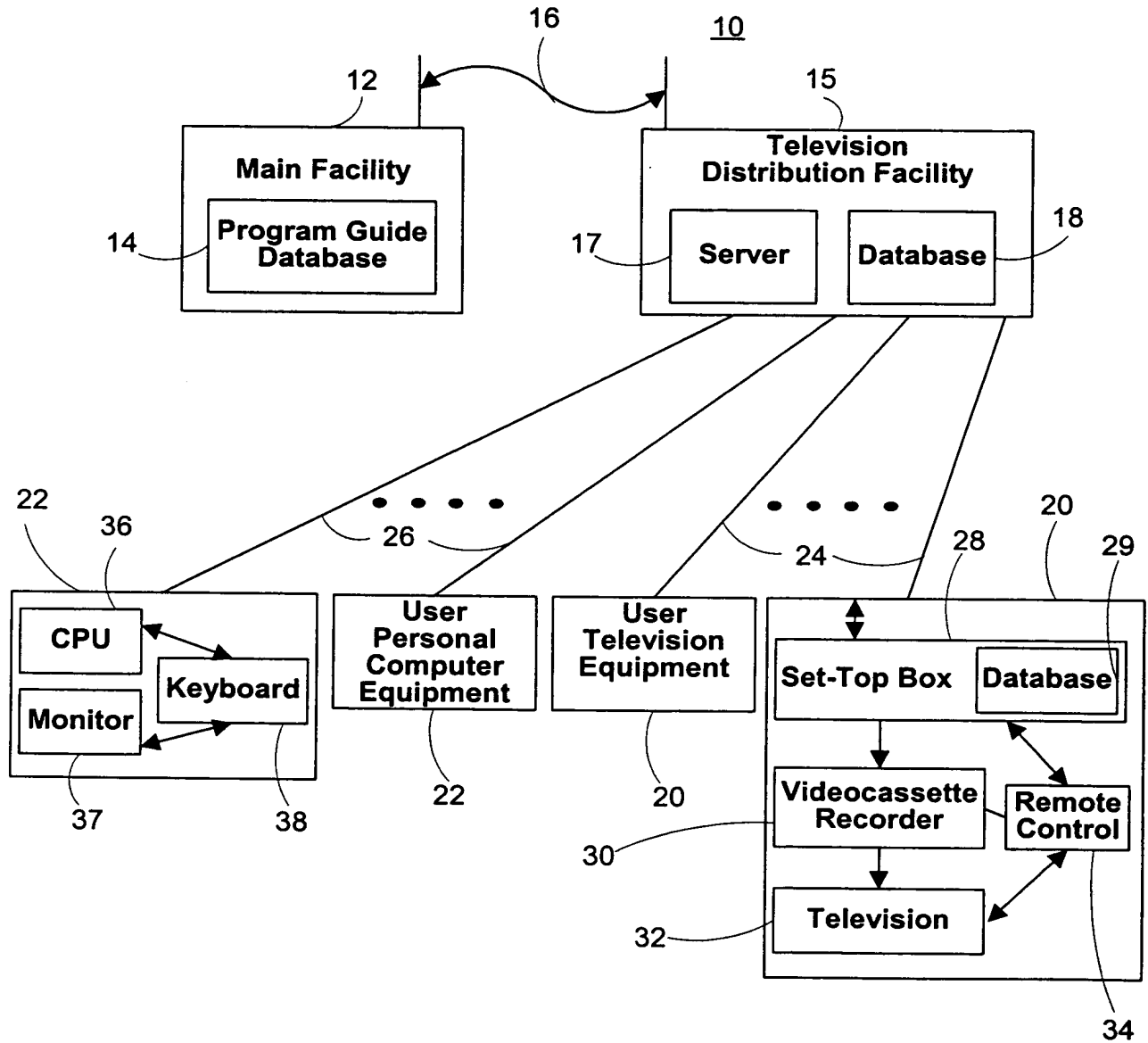
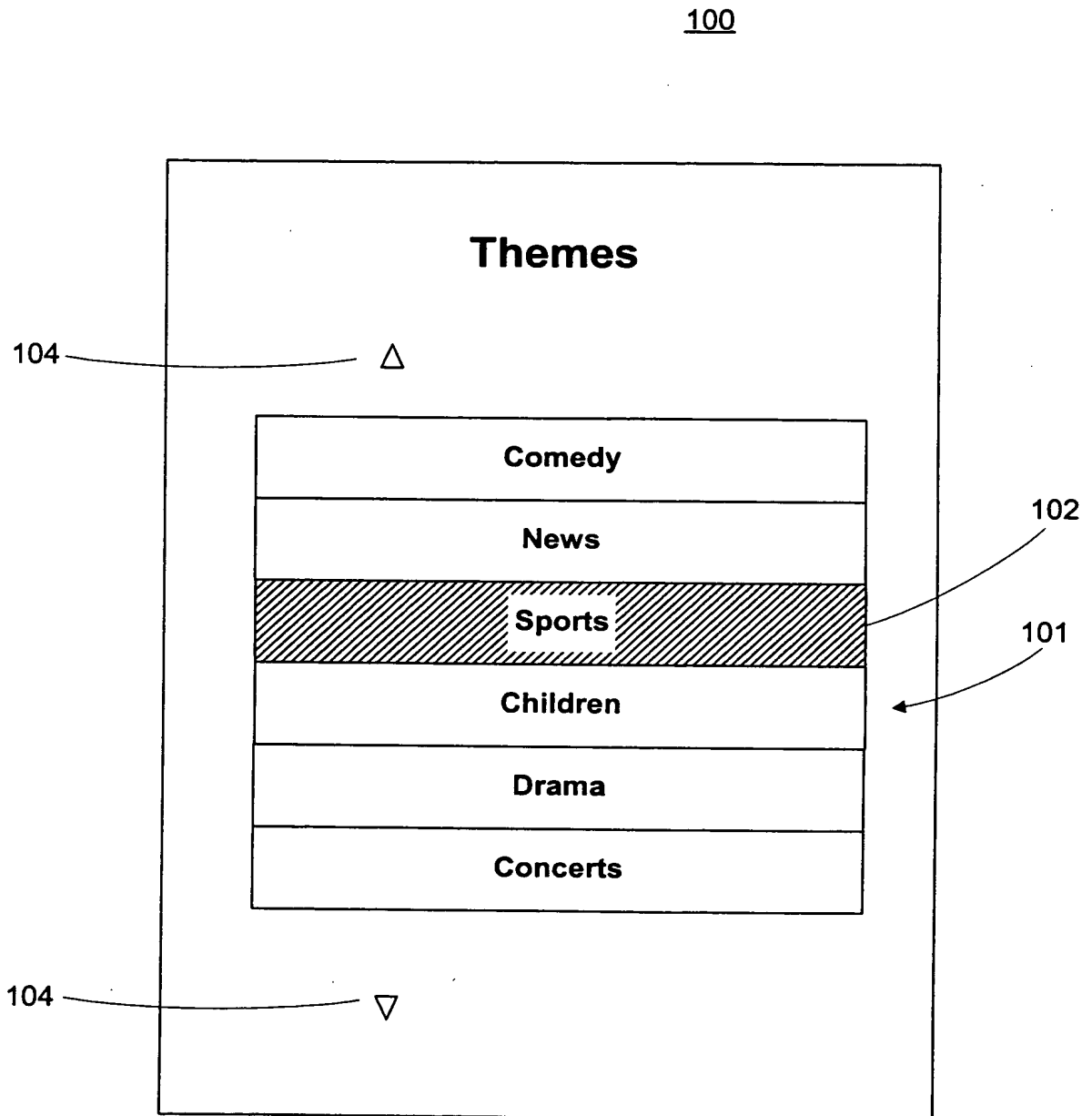
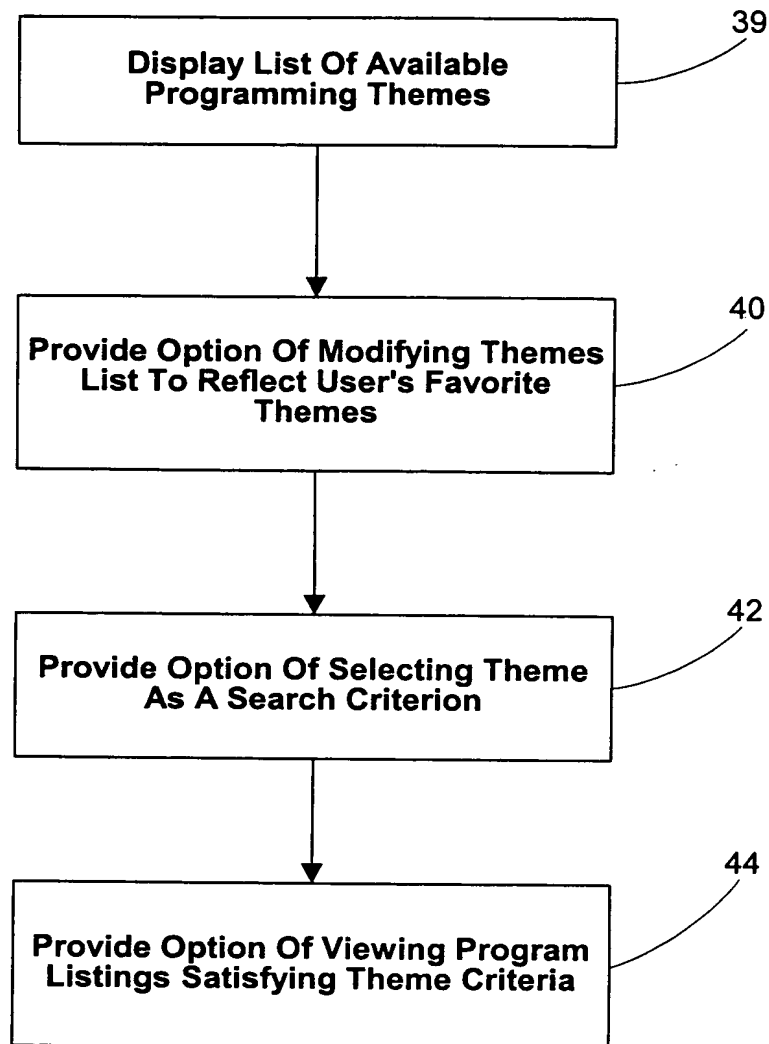


FIG. 1

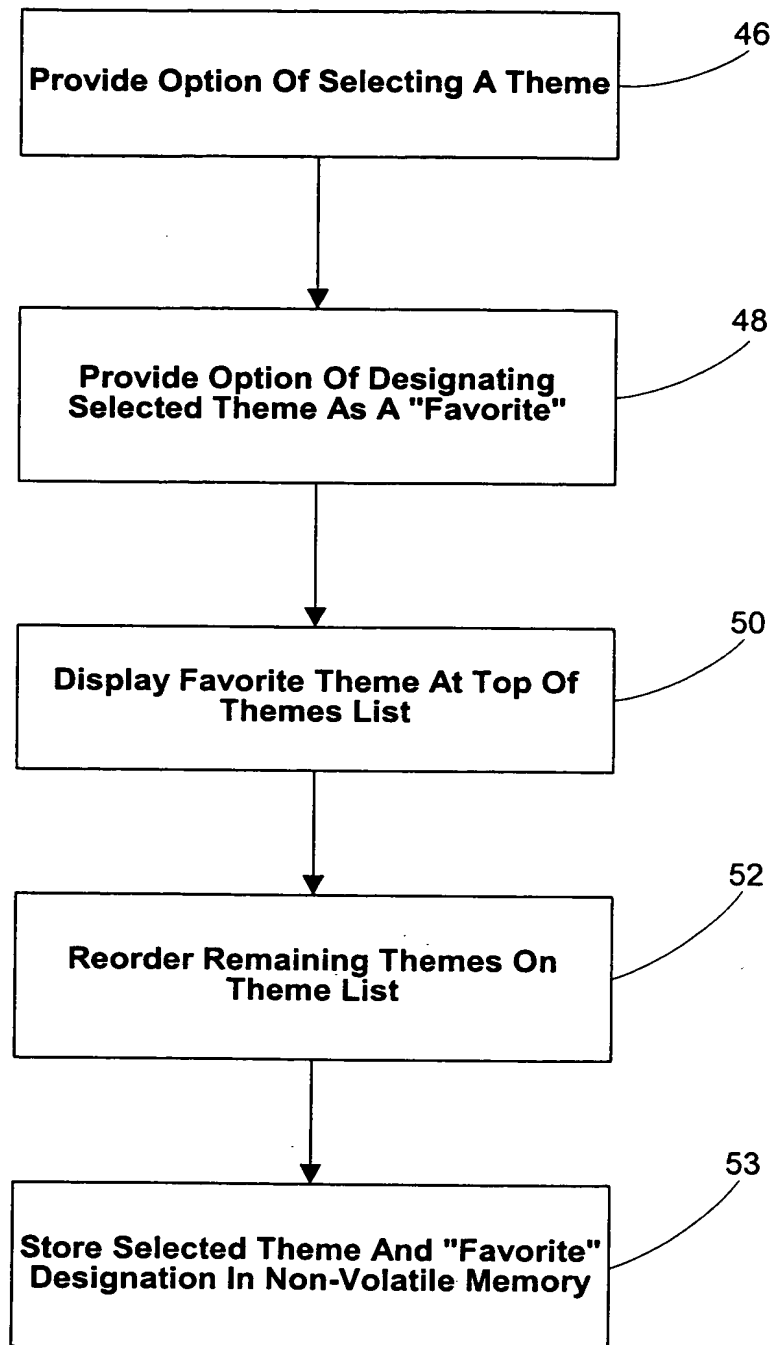


**FIG. 3**

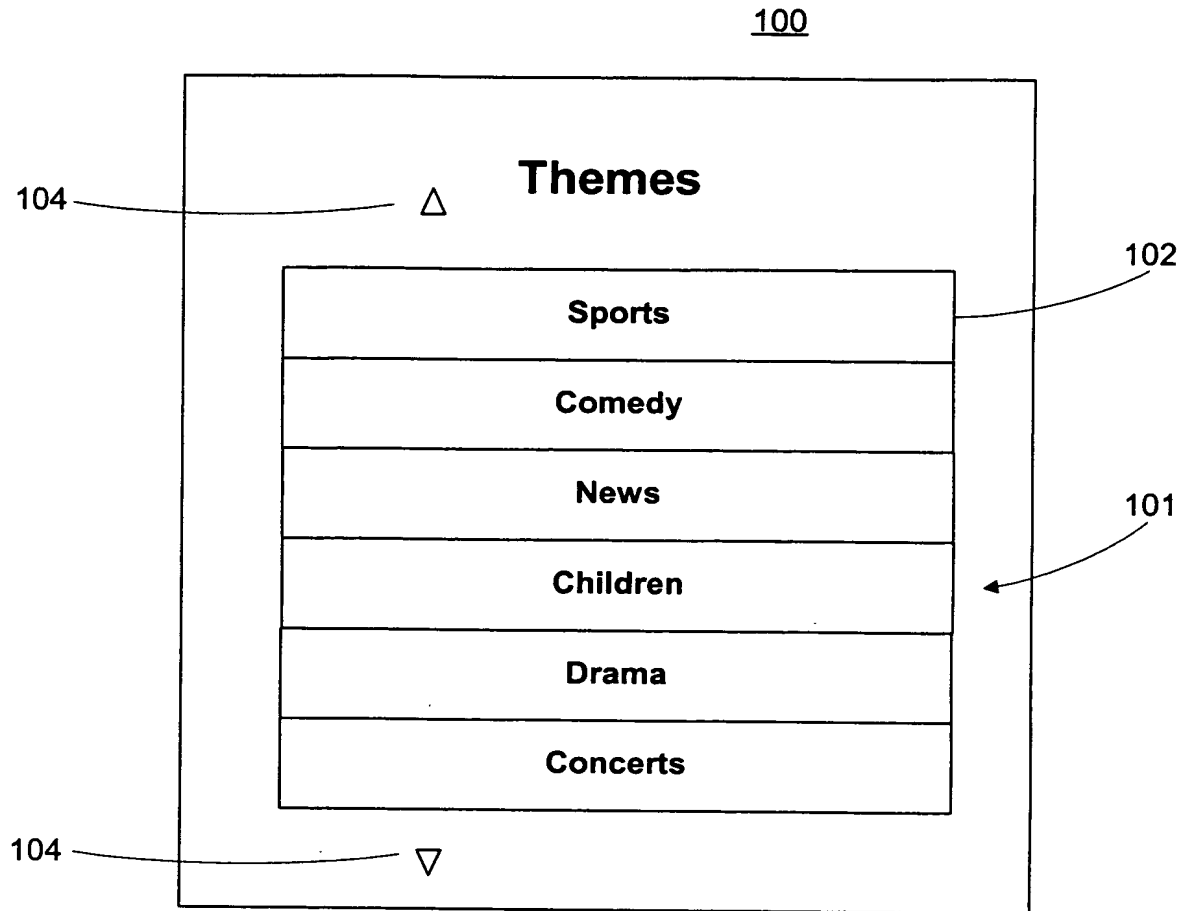




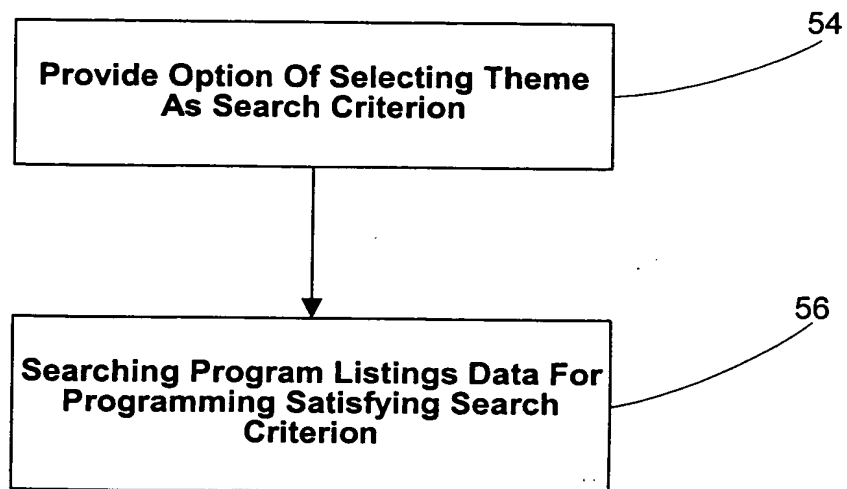
**FIG. 2**



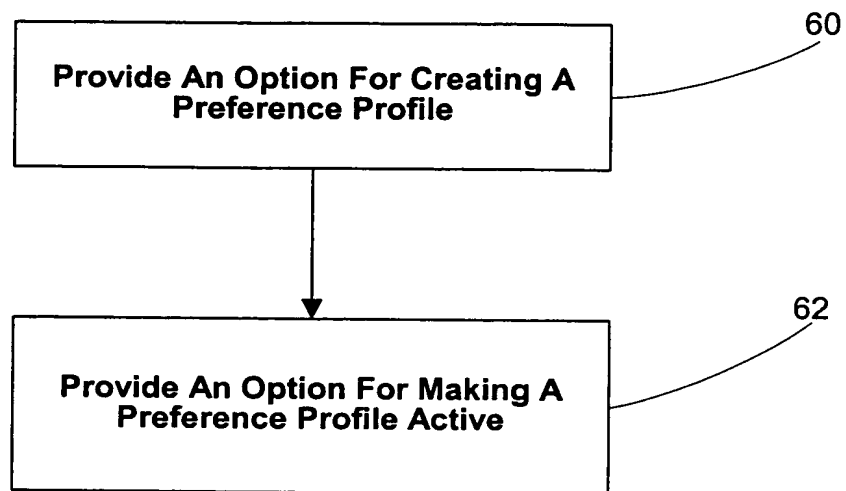
**FIG. 4**



**FIG. 5**



**FIG. 6**



**FIG. 7**

110

112

115

CH	7:00	7:30	8:00	8:30
6	NBA Basketball			
9	College Football			
28	Figure Skating			
30	College Football			
38	Track & Field			

FIG. 8(a)

120

122						
CH	7:00	7:30	8:00	8:30		
6	Comedy Program		NBA Basketball Favorite			
7	News Program					
8	Children's Program					
9	College Football Favorite			News		
10	Action Program					

124

125

126

**FIG. 8(b)**

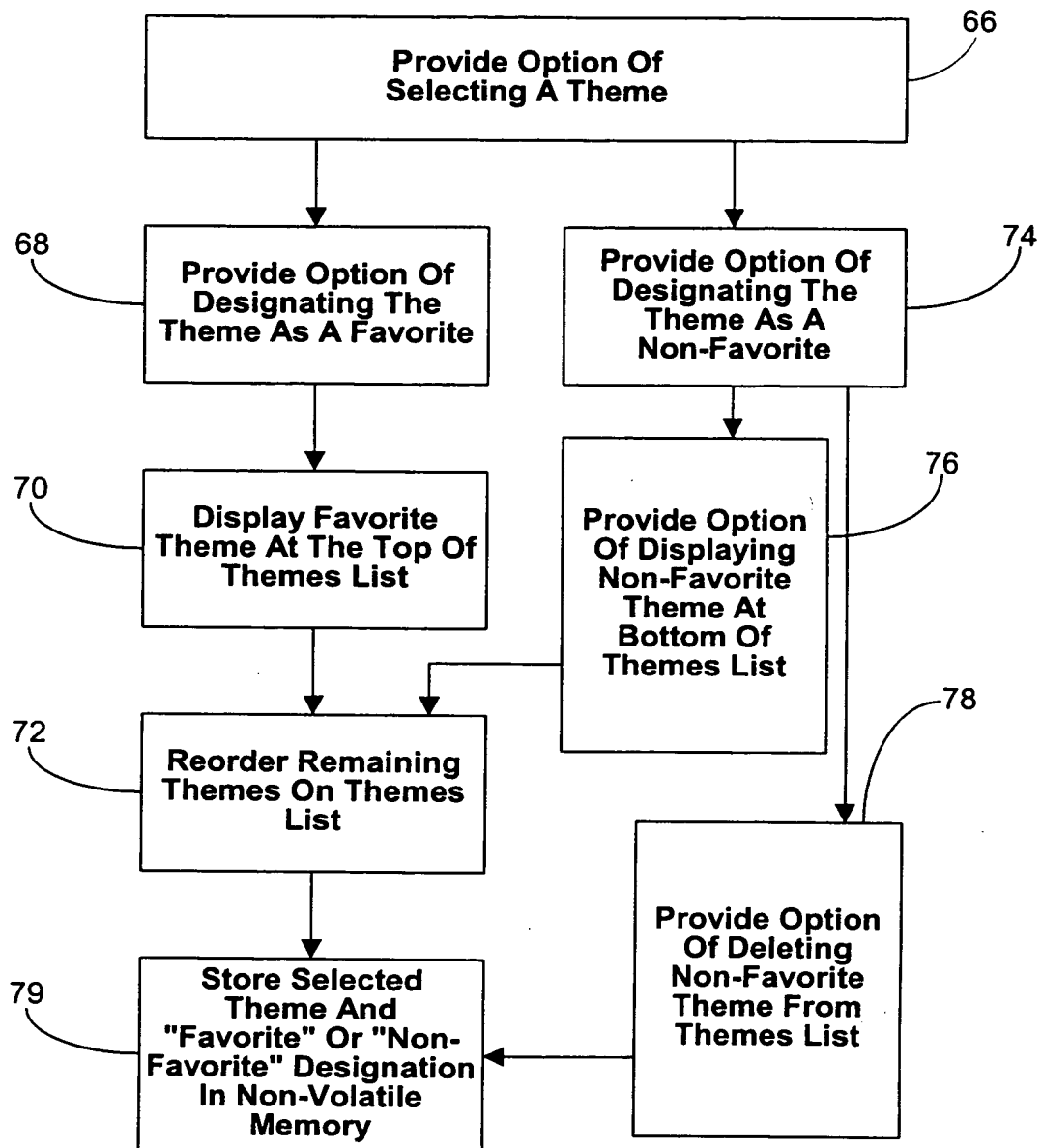


FIG. 9

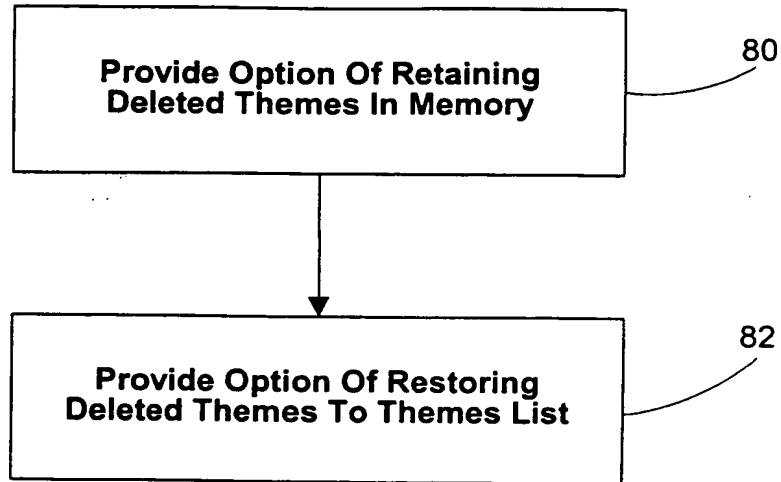


FIG. 10

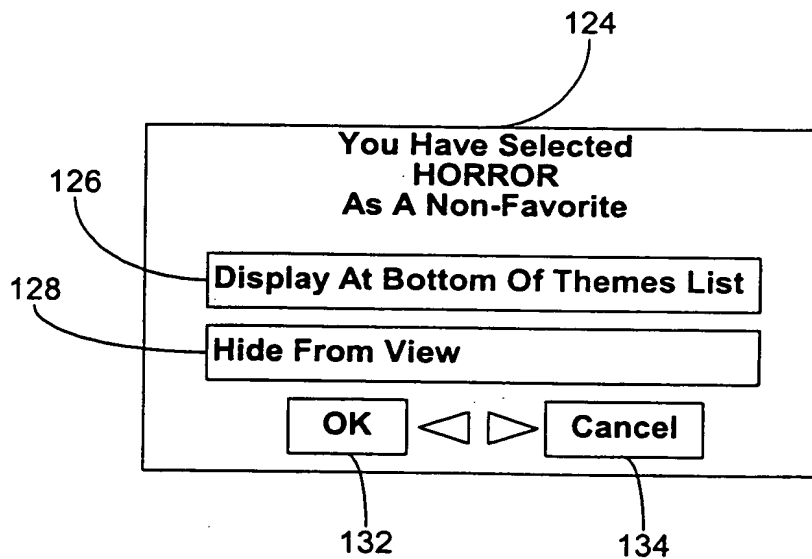
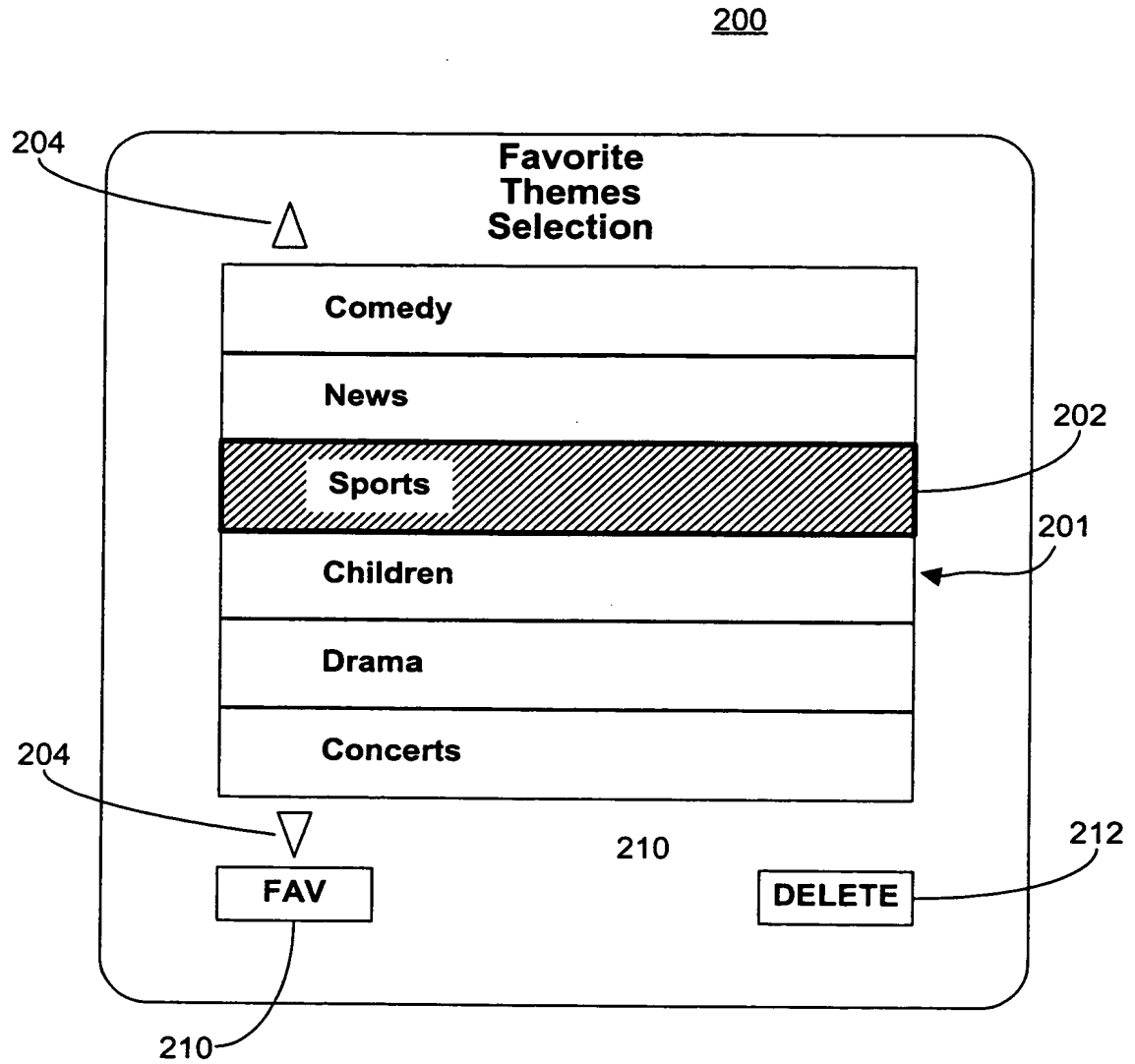
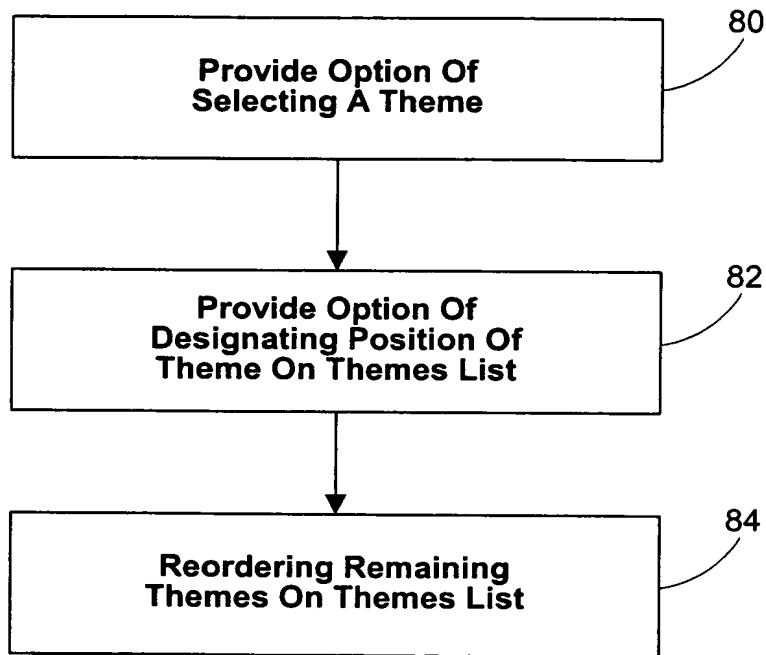


FIG. 11

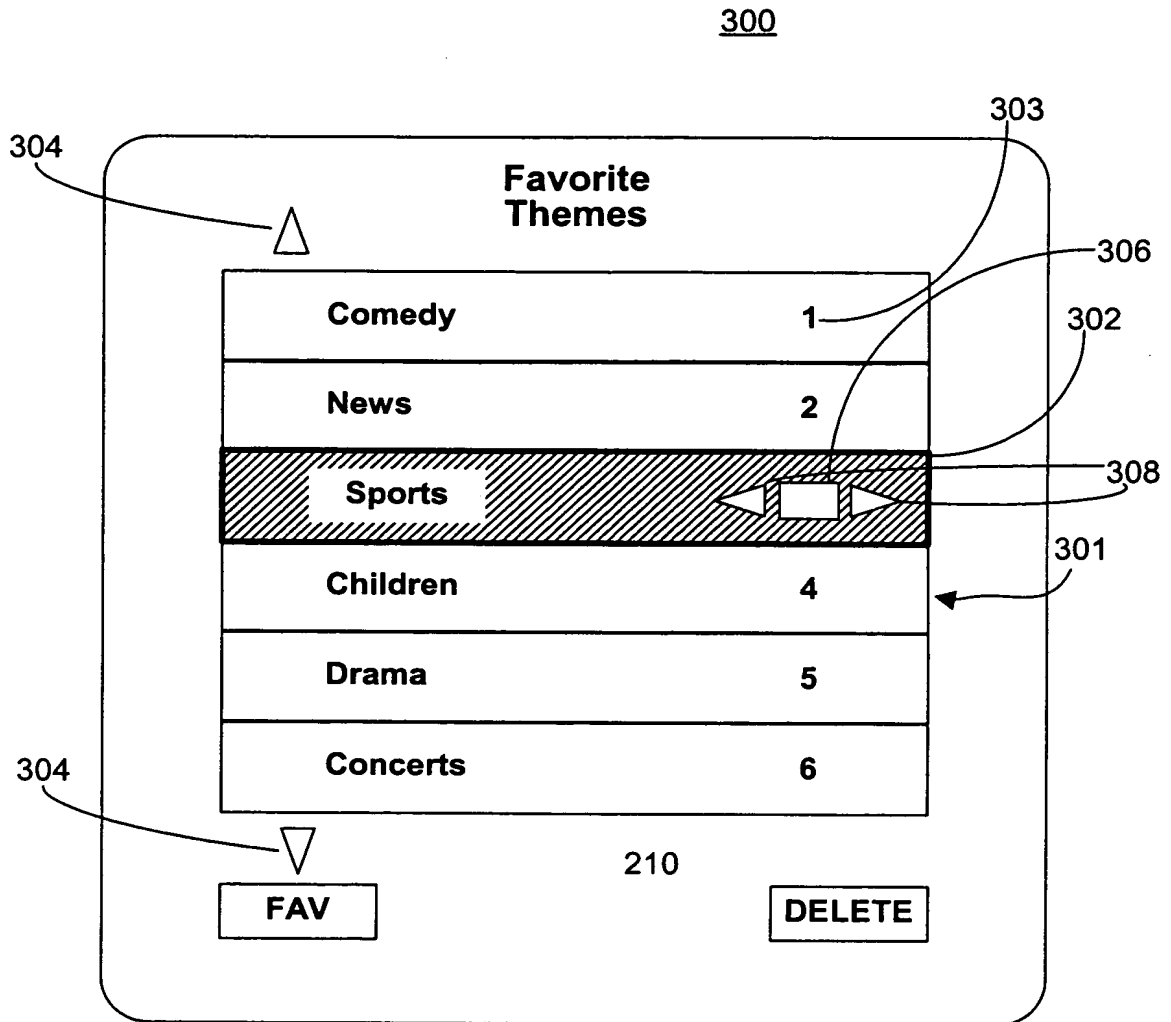




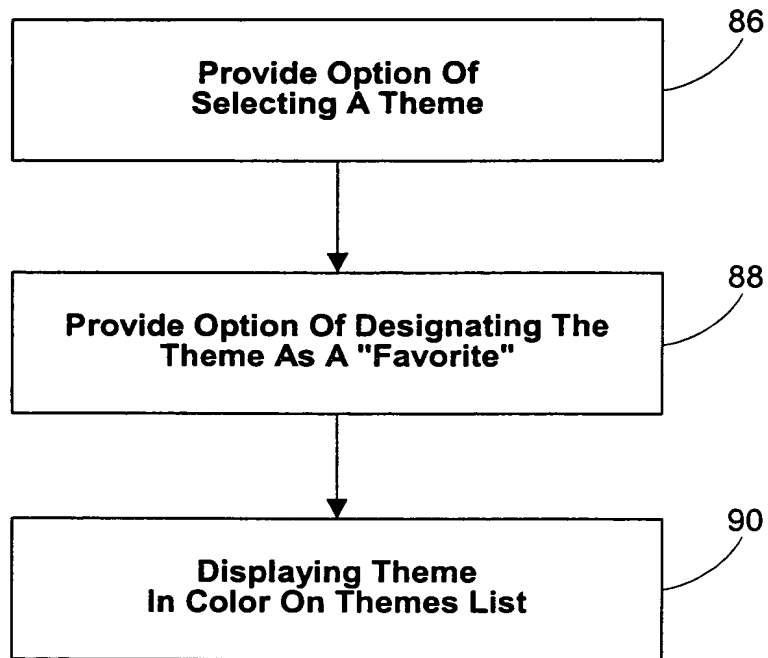
**FIG. 12**



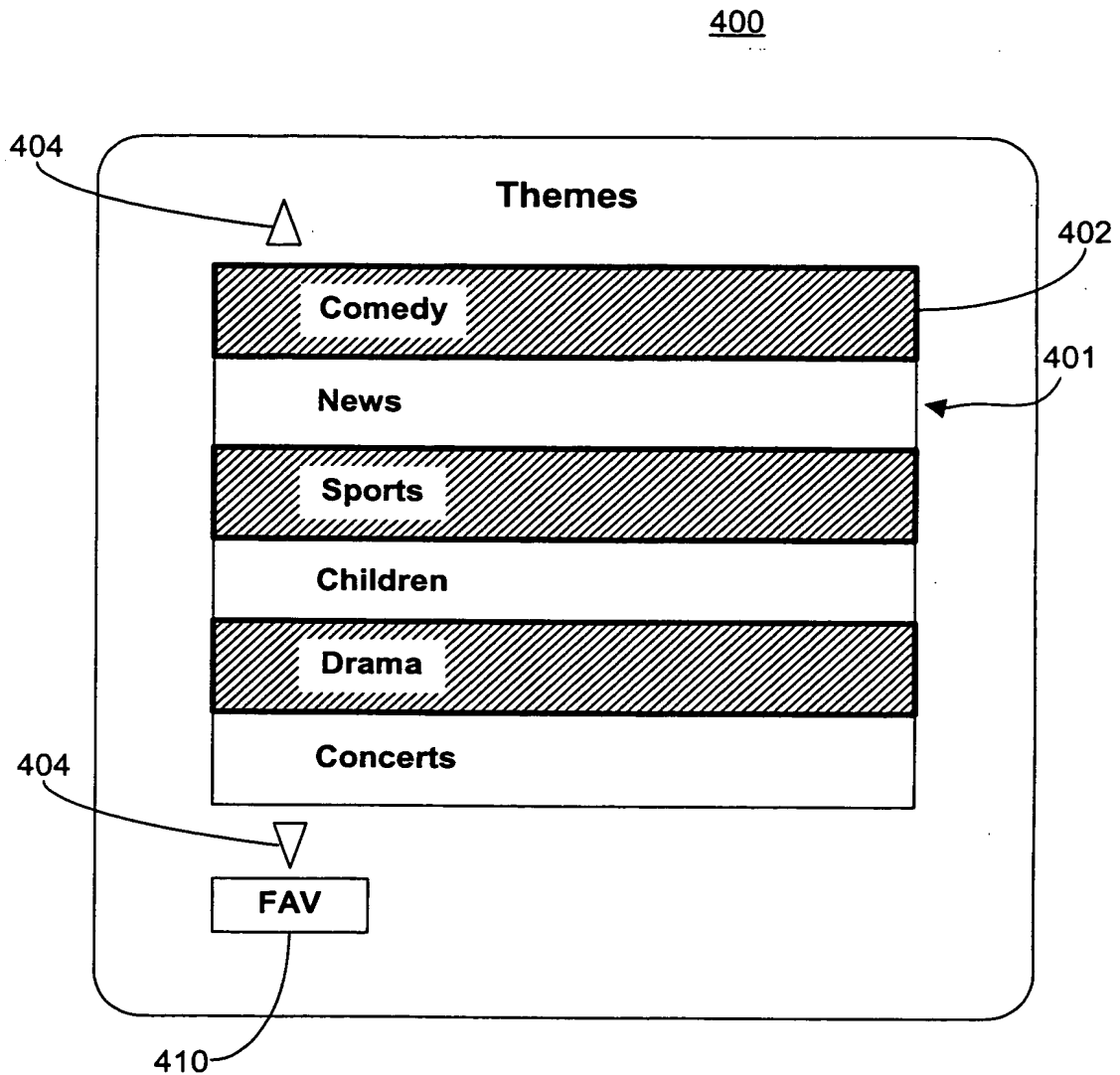
**FIG. 13**



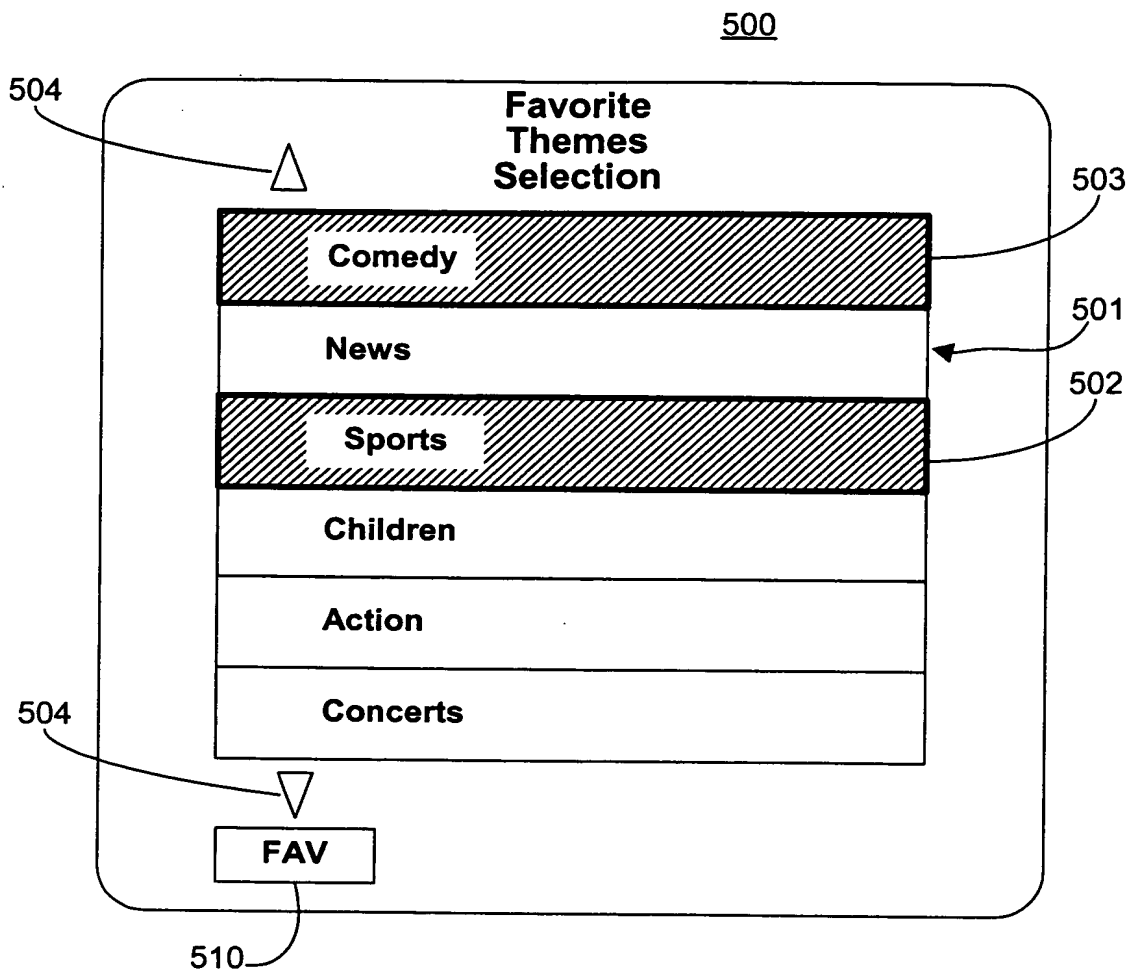
**FIG. 14**



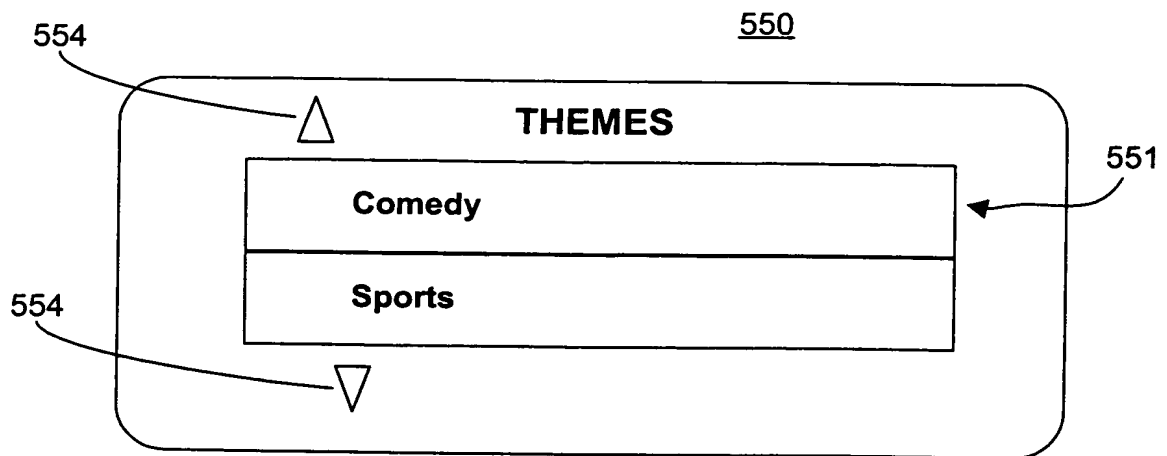
**FIG. 15**



**FIG. 16**



**FIG. 17**



**FIG. 18**

EXPRESS MAIL No.:  
EV 626909934 US

# EXHIBIT E

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicants : Joshua Rosenthal et al.  
Application No. : 09/262,658 Confirmation No. : 9736  
Filed : March 4, 1999  
For : PROGRAM GUIDE SYSTEM WITH USER  
DESIGNATED FAVORITE THEMES  
Group Art Unit : 2611  
Examiner : Jason P. Salce

New York, New York 10020  
January 13, 2005

Hon. Commissioner for Patents  
P.O. Box 1450  
Arlington, Virginia 22313-1450

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Sir:

In accordance with 37 C.F.R. §§ 1.56 and 1.97,  
applicants wish to call the attention of the Examiner to the  
following documents:

U.S. Patent Documents

Miller	4,081,753	03/28/78
Miller	4,170,782	10/09/79
Wine	4,271,532	06/02/81
Tults	4,367,559	01/04/83
Templin et al.	4,375,651	03/01/83
Lambert	4,381,522	04/26/83
Keiser	4,390,901	06/28/83
Merrell	4,425,579	01/10/84
Cichelli et al.	4,429,385	01/31/84
Deiss	4,495,654	01/22/85
Sirazi	4,527,194	07/02/85
Beyers, Jr.	4,641,205	02/03/87



Peers et al.	4,689,022	08/25/87
Kram et al.	4,754,326	06/28/88
Levine	4,908,713	03/13/90
Levine	4,963,994	10/16/90
Hallenbeck	5,038,211	08/06/91
Strubbe et al.	5,047,867	09/10/91
Hashimoto	5,075,771	12/24/91
Yee et al.	5,210,611	05/11/93
Keenan	5,317,403	05/31/94
Amano et al.	5,323,240	06/21/94
Graves et al.	5,410,344	04/25/95
Strubbe	5,432,561	07/11/95
Saitoh	5,444,499	08/22/95
Gilboy	5,465,113	11/07/95
Ohga et al.	5,465,385	11/07/95
Banker et al.	5,477,262	12/19/95
Cragun et al.	5,481,296	01/02/96
Strubbe et al.	5,483,278	01/09/96
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Florin et al.	5,621,456	04/15/97
Dunn	5,752,160	05/12/98
Hoffberg et al.	5,774,357	06/30/98
Hendricks et al.	5,798,785	08/25/98
Bedard	5,801,747	09/01/98
Davis et al.	5,822,123	10/13/98
Gerace	5,848,396	12/08/98
Wehmeyer	5,867,226	02/02/99
Hoffberg et al.	5,875,108	02/23/99
Lemmons et al.	5,880,768	03/09/99
Sabourin, et al.	5,903,545	05/11/99
Cragun et al.	5,973,683	10/26/99
Williams et al.	5,977,964	11/02/99
Barrett et al.	6,005,597	12/21/99
Herz	6,029,195	02/22/00
Rothmuller	6,075,526	06/13/00
Hoffberg et al.	6,081,750	06/27/00
Herz et al.	6,088,722	06/11/00
Schein et al.	6,133,909	10/17/00

Killian	6,163,316	12/19/00
Etheredge	6,172,674	01/09/01
Alexander et al.	6,177,931	01/23/01
Hendricks et al.	6,181,335	01/30/01
Maze et al.	6,216,264	04/10/01
Huang et al.	6,437,836	08/20/02
Knowles et al.	6,505,348	01/07/03

Foreign Patent Documents

GB	1 554 411	10/17/79
EPO	EP 0 721 253 A2	07/10/96
EPO	EP 0 774 866 A2	05/21/97
EPO	EP 0 854 645 A2	07/22/98
PCT	WO 86/01359	02/27/86
PCT	WO 89/03085	04/06/89
PCT	WO 94/13107	06/09/94
PCT	WO 94/14284	06/23/94
PCT	WO 95/28799	10/26/95
PCT	WO 96/17473	06/06/96
PCT	WO 96/41478	12/19/96
PCT	WO 97/48230	12/18/97
PCT	WO 98/26584	06/18/98
PCT	WO 98/43183	10/01/98
PCT	WO 98/48566	10/29/98
PCT	WO 99/01984	01/14/99
PCT	WO 99/45701	09/10/99
PCT	WO 00/04708	01/27/00
PCT	WO 00/05889	02/03/00
PCT	WO 00/28734	05/18/00
PCT	WO 99/14947	02/28/02
PCT	WO 99/45701	09/10/99
PCT	WO 99/45702	09/10/99
PCT	WO 00/04708	01/27/00
PCT	WO 00/13415	03/09/00
PCT	WO 00/33573	06/08/00

The aforementioned patent documents and publications  
are listed on the accompanying Form PTO-1449 (submitted in

duplicate). In accordance with 37 C.F.R. §1.98(a)(2), copies of the above-listed Foreign Patent Documents are enclosed herewith.

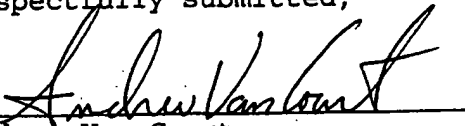
In accordance with 37 C.F.R. § 1.98, applicants would also like to call the Examiner's attention to the following documents:

Knudson et al.	09/330,792	06/11/99
McKissick et al.	09/378,533	08/20/99

Copies of these applications are enclosed herewith. These applications have not been listed on the accompanying Form PTO-1449 to prevent their Application Numbers from being printed on the face of any patent issuing from this application. Applicants respectfully request that the Examiner sign the statement "All references have been considered" on the bottom of page 4 of the enclosed Form PTO-1449 to indicate that these patent applications were considered (See MPEP § 609(III)(D)). Applicants request that a copy of Form PTO-1449, as considered by the Examiner, be returned with the next communication.

Consideration of the foregoing in relation to this  
patent application is respectfully requested.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Andrew Van Court", is written over a horizontal line.

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<b>FORM PTO-1449</b>  <b>SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANTS</b>	<b>U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE</b>	<b>ATTY. DOCKET NO.</b> UV-81	<b>APPLN. NO.</b> 09/262,658
		<b>APPLICANTS</b> Joshua Rosenthal et al.	<b>CONFIRMATION. NO.</b> 9736
		<b>FILING DATE</b> March 4, 1999	<b>GROUP ART</b> 2611

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIA TE
	4,081,753	03/28/78	Miller	325	396	
	4,170,782	10/09/79	Miller	358	84	
	4,271,532	06/02/81	Wine	455	186	
	4,367,559	01/04/83	Tufts	455	186	
	4,375,651	03/01/83	Templin et al.	358	191.1	
	4,381,522	04/26/83	Lambert	358	86	
	4,390,901	06/28/83	Keiser	358	147	
	4,425,579	01/10/84	Merrell	358	86	
	4,429,385	01/31/84	Cichelli et al.	370	92	
	4,495,654	01/22/85	Deiss	455	151	
	4,527,194	07/02/85	Sirazi	358	86	
	4,641,205	02/03/87	Beyers, Jr.	360	33.1	
	4,689,022	08/25/87	Peers et al.	434	307	
	4,754,326	06/28/88	Kram et al.	364	900	
	4,908,713	03/13/90	Levine	358	335	
	4,963,994	10/16/90	Levine	358	335	
	5,038,211	08/06/91	Hallenbeck	358	142	
	5,047,867	09/10/91	Strubbe et al.	358	335	
	5,075,771	12/24/91	Hashimoto	358	84	
	5,210,611	05/11/93	Yee et al.	358	191.1	
	5,317,403	05/31/94	Keenan	348	731	
	5,323,240	06/21/94	Amano et al.	348	731	
	5,410,344	04/25/95	Graves et al.	348	1	
	5,432,561	07/11/95	Strubbe	348	565	
	5,444,499	08/22/95	Saitoh	348	734	
	5,465,113	11/07/95	Gilboy	725	25	
	5,465,385	11/07/95	Ohga et al.	455	6.1	
	5,477,262	12/19/95	Banker et al.	348	7	
	5,481,296	01/02/96	Cragun et al.	348	13	
	5,483,278	01/09/96	Strubbe et al.	725	61	
	5,534,911	07/09/96	Levitan	348	1	

## EXAMINER

## DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not conformance and not considered. Include copy of this form with next communication to applicants.

Express Mail No.  
EV 371748188 US

<b>FORM PTO-1449</b>  <b>SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANTS</b>	<b>U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE</b>	<b>ATTY. DOCKET NO.</b> UV-81	<b>APPLN. NO.</b> 09/262,658
		<b>APPLICANTS</b> Joshua Rosenthal et al.	<b>CONFIRMATION. NO.</b> 9736
		<b>FILING DATE</b> March 4, 1999	<b>GROUP ART</b> 2611

	5,585,866	12/17/96	Miller et al.	348	731	
	5,600,364	02/04/97	Hendricks et al.	348	1	
	5,617,565	04/01/97	Augenbraum, et al.	395	604	
	5,621,456	04/15/97	Florin et al.	348	7	
	5,752,160	05/12/98	Dunn	455	5.1	
	5,774,357	06/30/98	Hoffberg et al.	364	188	
	5,798,785	08/25/98	Hendricks et al.	348	1	
	5,801,747	09/01/98	Bedard	348	1	
	5,822,123	10/13/98	Davis et al.	348	564	
	5,848,396	12/08/98	Gerace	705	10	
	5,867,226	02/02/99	Wehmeyer	725	46	
	5,875,108	02/23/99	Hoffberg et al.	364	146	
	5,880,768	03/09/99	Lemmons et al.	348	1	
	5,903,545	05/11/99	Sabourin, et al.	370	225	
	5,973,683	10/26/99	Cragun et al.	345	327	
	5,977,964	11/02/99	Williams et al.	345	327	
	6,005,597	12/21/99	Barrett et al.	725	9	
	6,029,195	02/22/00	Herz	709	219	
	6,075,526	06/13/00	Rothmuller	345	327	
	6,081,750	06/27/00	Hoffberg et al.	700	17	
	6,088,722	06/11/00	Herz et al.	709	217	
	6,133,909	10/17/00	Schein et al.	345	327	
	6,163,316	12/19/00	Killian	345	327	
	6,172,674	01/09/01	Etheredge	345	327	
	6,177,931	01/23/01	Alexander et al.	345	327	
	6,181,335	01/30/01	Hendricks et al.	345	328	
	6,216,264	04/10/01	Maze et al.	725	53	
	6,437,836	08/20/02	Huang et al.	348	734	
	6,505,348	01/07/03	Knowles et al.	725	49	

## FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not conformance and not considered. Include copy of this form with next communication to applicants.

FORM PTO-1449	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO. UV-81	APPLN. NO. 09/262,658
SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANTS		APPLICANTS Joshua Rosenthal et al.	CONFIRMATION. NO. 9736
		FILING DATE March 4, 1999	GROUP ART 2611

	1 554 411	10/17/79	GB	H04B	3/54		
	EP 0 721 253 A2	07/10/96	EPO	H03J	1/04		
	EP 0 774 866 A2	05/21/97	EPO	H04N	5/44		
	EP 0 854 645 A2	07/22/98	EPO	H04N	5/445		
	WO 86/01359	02/27/86	PCT	H04N	5/445		
	WO 89/03085	04/06/89	PCT	G06F	7/04		
	WO 94/13107	06/09/94	PCT	H04N	7/16		
	WO 94/14284	06/23/94	PCT	H04N	7/16		
	WO 95/28799	10/26/95	PCT	H04N	1/00		
	WO 96/17473	06/06/96	PCT	H04N	5/445		
	WO 96/41478	12/19/96	PCT	H04N	7/173		
	WO 97/48230	12/18/97	PCT	H04N	7/00		
	WO 98/26584	06/18/98	PCT	H04N	5/445		
	WO 98/43183	10/01/98	PCT	G06F	17/30		
	WO 98/48566	10/29/98	PCT	H04N	5/445		
	WO 99/01984	01/14/99	PCT	H04N	7/173		
	WO 99/45701	09/10/99	PCT	H04N	5/445		
	WO 00/04708	01/27/00	PCT	H04N	5/445		
	WO 00/05889	02/03/00	PCT	H04N	7/16		
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	WO 99/45701	09/10/99	PCT	H04N	5/445		
	WO 99/45702	09/10/99	PCT	H04N	5/445		
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	WO 00/13415	03/09/00	PCT	H04N	7/173		
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<b>FORM PTO-1449</b> <b>U.S. DEPARTMENT OF COMMERCE</b> <b>PATENT AND TRADEMARK OFFICE</b>  <b>SUPPLEMENTAL INFORMATION DISCLOSURE</b> <b>STATEMENT BY APPLICANTS</b>	<b>ATTY. DOCKET NO.</b> UV-81	<b>APPLN. NO.</b> 09/262,658
	<b>APPLICANTS</b> Joshua Rosenthal et al.	<b>CONFIRMATION. NO.</b> 9736
	<b>FILING DATE</b> March 4, 1999	<b>GROUP ART</b> 2611

**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)**

<b>EXAMINER INITIAL</b>	

All references have been considered. \_\_\_\_\_

Examiner

**EXAMINER**

**DATE CONSIDERED**

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	4,390,901	06/28/83	Keiser	358	147	
	4,425,579	01/10/84	Merrell	358	86	
	4,429,385	01/31/84	Cichelli et al.	370	92	
	4,495,654	01/22/85	Deiss	455	151	
	4,527,194	07/02/85	Sirazi	358	86	
	4,641,205	02/03/87	Beyers, Jr.	360	33.1	
	4,689,022	08/25/87	Peers et al.	434	307	
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	4,908,713	03/13/90	Levine	358	335	
	4,963,994	10/16/90	Levine	358	335	
	5,038,211	08/06/91	Hallenbeck	358	142	
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EV 371748188 US

FORM PTO-1449  SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANTS	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTY. DOCKET NO. UV-81	APPLN. NO. 09/262,658
		APPLICANTS Joshua Rosenthal et al.	CONFIRMATION. NO. 9736
		FILING DATE March 4, 1999	GROUP ART 2611

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EXAMINER INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

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<b>FORM PTO-1449</b> <b>U.S. DEPARTMENT OF COMMERCE</b> <b>PATENT AND TRADEMARK OFFICE</b>  <b>SUPPLEMENTAL INFORMATION DISCLOSURE</b> <b>STATEMENT BY APPLICANTS</b>	<b>ATTY. DOCKET NO.</b> UV-81	<b>APPLN. NO.</b> 09/262,658
	<b>APPLICANTS</b> Joshua Rosenthal et al.	<b>CONFIRMATION. NO.</b> 9736
	<b>FILING DATE</b> March 4, 1999	<b>GROUP ART</b> 2611

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<b>EXAMINER INITIAL</b>	

All references have been considered. \_\_\_\_\_

Examiner

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# EXHIBIT G

SERIES REMINDERS AND SERIES RECORDING FROM  
AN INTERACTIVE TELEVISION PROGRAM GUIDE

This application claims the benefit of United States provisional application No. 60/088,888 filed  
5 June 11, 1998.

Background of the Invention

This invention relates to interactive television program guides, and more particularly, to interactive television program guides with program  
10 series reminder and recording capabilities.

Cable, satellite, and broadcast television systems provide viewers with a large number of television channels. Viewers have traditionally consulted printed television program schedules to  
15 determine the programs being broadcast at a particular time. More recently, interactive television program guides have been developed that allow television program information to be displayed on a viewer's television.

20 Interactive program guides are typically implemented on set-top boxes. Such program guides allow users to view television program listings in different display formats. For example, a user may instruct the program guide to display a grid or table

of program listings organized in a channel-ordered or a time-ordered list. Users may also search and sort program listings by genre (e.g., movies, sports, etc.) or by title (i.e., alphabetically). A user may obtain  
5 additional information for a program by placing a highlight region on a desired program listing and pressing an "info" button.

Program guide data such as program listings, pay-per-view program purchasing information,  
10 promotional information, etc. is provided to users' set-top boxes with a data distribution system. Program guide data is typically stored in a central program guide database. Program guide data from the central database is transmitted to the headend facilities of  
15 various cable systems. Each headend distributes the program guide data to the set-top boxes in its system.

Some systems allow the user to set reminders to notify the user when certain television programs are to be aired. In such systems, when a user sets a  
20 reminder, the program guide will notify the user just prior to when the program is scheduled to be aired or automatically cause the system to tune to the program as it begins airing. However, if the user watches the same program each week and wishes to be notified with a  
25 reminder each time the program airs, a new reminder typically must be set by the user each time.

Some systems allow the user to select a program for recording by placing the highlight region on a program listing and pressing a "record" button.  
30 Moreover, the user may be able to schedule an upcoming program for recording. In such systems, when a user has scheduled a program to be recorded, the program

guide may automatically cause the system to tune to the program as it begins airing, send a record command to a videocassette recorder to begin recording the program, and then stop the videocassette recorder from recording  
5 at the end of the program. The system may allow the user to record a program once, daily, weekly, or just weekdays. However, in order for the system to correctly record a program in a series each time it  
10 airs, the program must air at the same time and channel. If the program airs at a different channel or time, or if the user wishes to change the scheduled time or channel of recording, the programs in the series may not be recorded properly.

It is therefore an object of the present  
15 invention to provide an interactive television program guide system with program series reminder and recording capabilities.

#### Summary of the Invention

This and other objects of the invention are  
20 accomplished in accordance with the principles of the present invention by providing an interactive television program guide with series reminder and series recording capabilities.

Program guide data is generally available in  
25 a data source of a main facility. The main facility provides data from the data source to multiple television distribution facilities via communications links. The data transmitted by the main facility to the television distribution facilities typically  
30 include at least television program listings data such as program times, channels, titles, ratings,



categories, and descriptions. In addition, television  
program listings data may include information  
indicating whether the program is an episode of a  
program series and if the program is a new episode or a  
5 rerun.

Each television distribution facility  
distributes the television program listings data to  
multiple users via communications paths. Each user has  
user television equipment for displaying the television  
10 program listings information. The communications paths  
preferably have sufficient bandwidth to allow the  
television distribution facility to distribute multiple  
channels of television programming to the user  
television equipment.

15 The user television equipment that receives  
and processes the television program listings data from  
the television distribution facility may include a set-  
top box and a videocassette recorder. The set-top box  
may display television program listings on the user's  
20 display screen in the form of an interactive grid or  
list if desired. The user can interact with the  
television program guide by entering commands via a  
user input interface. An illustrative user input  
interface is an infrared remote control with arrow  
25 keys, a "guide" button, a "record" button, an "info"  
button, and various other keys.

When the user presses "guide," a grid or list  
is displayed that contains television program listings.  
For example, the program listings may be displayed in a  
30 grid format organized in channel order from top to  
bottom and by broadcast time from left to right. The  
user may scroll through the listings to locate programs

at different times in the day or different days in the week using the arrow keys. The user can also position a highlight region on the desired entry by using the arrow keys.

5           If a user selects a program or pay-per-view event from the program listings, the user may set a reminder, which directs the system to generate a reminder message just before the scheduled broadcast time of the selected program to remind the user of the  
10 selected program. The user may schedule the program to be recorded on the videocassette recorder. The program guide may direct the set-top box to initiate recording of the program at the proper time. Recording a program in this way causes the set-top box to send a record  
15 command over a control path to the videocassette recorder.

          When a user orders a reminder or schedules a recording, the system will determine if the selected program is an episode of a program series. If the  
20 selected program is not an episode of a series, the system will allow the user to order a reminder or schedule a recording for that single broadcast. If the selected program is an episode of a series, the program automatically presents the user with an opportunity to  
25 set a reminder or schedule a recording for that single episode or to set a reminder or schedule a recording for each episode of the series. In addition, other options may be provided that allow the user to determine, for example, whether to schedule  
30 reminders/recordings for episodes on all channels on which the program airs or only on the selected channel, whether to schedule reminders/recordings for all

episodes including reruns or only new episodes, and whether to schedule reminders/recordings for episodes on all days or only on the selected day of the week. Moreover, other options may be provided that allow the user to schedule recordings for episodes that have not been recorded in the past or to set reminders for episodes that have not been viewed by the user in the past.

Before the scheduled broadcast time of each episode of each selected program series, the system sends a reminder message to the user that reminds the user of the program episode or sends a record command to the videocassette recorder or otherwise initiates recording of the episode.

The user may also view a list of all currently requested program reminders. Information such as the program name, type of program reminder, and the date and time the request was submitted may be displayed in the list for each reminder. The list may also indicate whether the entry represents a single program broadcast (a one-time reminder) or an episode of a program series. The list may also indicate whether or not the program is a rerun.

The user may view a list of all currently scheduled program recordings. Information such as the program name, the date and time the request was submitted, the date, time, channel, and length of the recording, and whether the scheduled entry represents a single program or an episode of a program series may be displayed for each entry.

Entries may be added to either the program reminder list or recording list as soon as the user

makes a new request for either a reminder or recording. Moreover, if broadcast schedule information for any entry in either list is updated in the program listings, the system will automatically update the  
5 lists accordingly to match the new broadcast schedule information. This may prevent the user from missing a reminder or recording due to unexpected programming schedule changes. The user may also update or change any entry in either list manually using the remote  
10 control. In addition, the user may cancel any entry if the user no longer wishes to record or be reminded of an individual program, an episode of a series or the entire series. If the user selects a program from the program listings for which a reminder has already been  
15 set or a recording scheduled, the system will provide the user with an opportunity to edit or cancel entries from the reminder or recording lists.

If the user sets a reminder that conflicts with an existing reminder, the system may inform the  
20 user of the conflict. The system may issue multiple reminders. If desired, the user may be provided with an opportunity to resolve conflicts between reminders by allowing the user to select preferred reminders. However, systems having a single videocassette recorder  
25 used for recording and because a videocassette recorder can only record a single program at a time, scheduled recording conflicts should be resolved. Recording conflicts may be resolved in several ways. Recording conflicts may, for example, be resolved automatically  
30 by the system based on specified user preferences. The user may resolve conflicts directly as soon as the conflicts are detected. The system may allow the user

to resolve any conflicts immediately or at a later, more convenient time. Alternatively, if the system provides for simultaneous recordings, the system may not inform the user of the conflict or provide the user  
5 with an opportunity to resolve the conflict.

Further features of the invention, its nature and various advantages will be more apparent from the accompanying drawings and the following detailed description.

#### 10 Brief Description of the Drawings

FIG. 1 is a schematic block diagram of an illustrative system in accordance with the present invention.

FIG. 2 is a schematic block diagram of  
15 illustrative user television equipment in accordance with the present invention.

FIG. 3 is a generalized schematic block diagram of portions of the illustrative television equipment of FIG. 2.

20 FIGS. 4 and 5 are illustrative program guide display screens in accordance with the present invention.

FIG. 6 is an illustrative detailed remind/record display screen in accordance with the  
25 present invention.

FIG. 7 is an illustrative reminder screen that allows the user to enter information for setting reminders in accordance with the present invention.

FIG. 8 is an illustrative information screen  
30 that allows the user to enter more information when

setting reminders in accordance with the present invention.

FIG. 9 is a diagram of an illustrative reminder displayed on the user's television screen in accordance with the present invention.

FIG. 10 is a diagram of an illustrative reminder screen listing all current reminders in accordance with the present invention.

FIG. 10a is an illustrative reminder screen that allows the user to view, update, or cancel reminders in accordance with the present invention.

FIG. 11 is an illustrative recording screen that allows the user to enter information for scheduling recordings in accordance with the present invention.

FIG. 12 is a diagram of an illustrative recording screen listing all currently scheduled recordings in accordance with the present invention.

FIG. 12a is an illustrative recording screen that allows the user to view, update, or cancel recordings in accordance with the present invention.

FIG. 13 is a diagram of an illustrative reminder screen listing all current reminders and detected conflicts in accordance with the present invention.

FIG. 14 is a diagram of an illustrative recording screen listing all currently scheduled recordings and detected conflicts in accordance with the present invention.

FIGS. 15 and 16 are illustrative recording screens that allow the user to resolve recording conflicts in accordance with the present invention.

FIG. 17 is a diagram showing the interrelationships between various program guide display screens that may be selected in accordance with the present invention.

5 Detailed Description of the Preferred Embodiments

An illustrative system 10 in accordance with the present invention is shown in FIG. 1. Main facility 12 provides data from data source 14 to television distribution facility 16 via communications  
10 link 18. Link 18 may be a satellite link, a telephone network link, a cable or fiber optic link, a microwave link, a combination of such links, or any other suitable communications path. If it is desired to transmit video signals over link 18 in addition to data  
15 signals, a relatively high bandwidth link such as a satellite link may generally be preferable to a relatively low bandwidth link such as a telephone line. Television distribution facility 16 may be a cable system headend, a broadcast distribution facility, a  
20 satellite television distribution facility, or other such suitable data distribution facility.

Only one such television distribution facility 16 is shown in FIG. 1 to avoid overcomplicating the drawings. In general, however,  
25 main facility 12 distributes data to many such television distribution facilities in parallel. For clarity, the present invention will be described primarily in the context of a single television distribution facility 16.

30 The data transmitted by main facility 12 to television distribution facility 16 includes television

program listings data (e.g., program times, channels, ratings, program categories, titles, and descriptions of individual programs, episodes of series, or entire series). In addition, television program listings data  
5 may include information indicating whether a given program is a single broadcast or an episode of a program series. The data may also include information whether a given program is a new first-run episode or is a rerun and whether a given program is a network or  
10 syndicated episode.

Television distribution facility 16 distributes the television program listings data to multiple users via communications paths 20. Each user has user television equipment 22 for displaying the  
15 television program listings information with an interactive television program guide implemented on user television equipment 22. Communications paths 20 preferably have sufficient bandwidth to allow television distribution facility 16 to distribute  
20 television programming to user television equipment. If desired, the television programming or data may be provided over separate communications paths.

An illustrative arrangement for user television equipment 22 is shown in FIG. 2. User  
25 television equipment 24 of FIG. 2 receives video and data from television distribution facility 16 (FIG. 1) at input 26. During normal television viewing, the user tunes set-top box 28 to a desired television channel. The signal for that television channel is  
30 then provided at video output 30 either as a radio-frequency (RF) signal on a predefined channel (e.g., channel 3 or 4) or as a demodulated video signal or



digital signal. The video signal at output 30 may be received by videocassette recorder 32, so that the user may record programs. Program recording and other features may be controlled by set-top box 28 using  
5 control path 34. A typical control path 34 involves the use of an infrared transmitter coupled to the infrared receiver in videocassette recorder 32 that normally accepts commands from a remote control such as remote control 40. Remote control 40 may be used to  
10 control set-top box 28, videocassette recorder 32, and television 36.

Television 36 receives radio-frequency or demodulated video signals or digital signals from videocassette recorder 32 or set-top box 28 via  
15 communications path 38. The video signals on communications path 38 may either be generated by videocassette recorder 32 when playing back a prerecorded videocassette or may be passed through videocassette recorder 32 from set-top box 28. During  
20 normal television viewing, the video signals provided to television 36 correspond to the desired channel to which the user has tuned with set-top box 28. When the user wishes to view interactive television program guide information, the user may, for example, press a  
25 "guide" button on remote control 40 or view the information using other suitable technique. When set-top box 28 receives commands from remote control 40 that inform set-top box 28 that the guide button has been pressed, the interactive television program guide  
30 is invoked and processing circuitry within set-top box 28 displays various program guide display screens on television 36.

A more generalized embodiment of the user television equipment of FIG. 2 is shown in FIG. 3. As shown in FIG. 3, video and data signals from television distribution facility 16 (FIG. 1) are  
5 received by control circuitry 42 of user television equipment 44. Video signals are typically provided on multiple television channels. Data may be provided by transmission on a television channel sideband, in the vertical blanking interval of a television channel, as  
10 a digital data stream either in-band with programming or out-of-band, or by any other suitable analog or digital data transmission technique.

The user controls the operation of user television equipment 44 with user input interface 46.  
15 User input interface 46 may be a pointing device, wireless remote control, keyboard, touch pad, voice recognition system, or any other suitable user input device. To watch television, the user instructs control circuitry 42 to display a desired television  
20 channel on monitor 48 or any other suitable display device such as a computer monitor. To record a program, the user instructs control circuitry 42 to record a desired television program using recording device 45 or any other suitable recording device such  
25 as a recordable DVD or a harddisk. To view program guide information, the user instructs control circuitry 42 to display a program guide display screen on monitor 48.

The functions of control circuitry 42 may be  
30 provided using the set-top box arrangement of FIG. 2. Alternatively, these functions may be integrated into a television or videocassette recorder arrangement.

These functions may also be provided by an advanced television receiver such as a high-definition television (HDTV) receiver, a personal computer television (PC/TV) or the like. If desired, a  
5 combination of such arrangements may be used.

If desired, an interactive television program guide may be implemented on system 10 using a client-server architecture. For example, a server at television distribution facility 16 (17 of FIG. 1) may  
10 operate in cooperation with user television equipment 22 which acts as a client. With this type of arrangement, some program guide functions (such as functions related to maintaining a program listings database) may be performed primarily at the server,  
15 whereas other functions (such as display and user input functions) may be performed primarily at user television equipment 22. Moreover, in such a client-server architecture implementation, some or all of the reminder and recording functions may be implemented on  
20 the server. Further features of an illustrative interactive television program guide implemented on a client-server architecture are described in Hassell et al. U.S. patent application Serial No. \_\_\_\_\_, filed concurrently herewith (Attorney Docket No. UV-110),  
25 which is hereby incorporated by reference herein in its entirety. Further features of an illustrative interactive television program guide implemented on a client-server architecture where recordings are performed on the server are described in Ellis et al.  
30 U.S. patent application Serial No. \_\_\_\_\_, filed concurrently herewith (Attorney Docket No. UV-84),

which is hereby incorporated by reference herein in its entirety.

When a user indicates a desire to view television program guide information (e.g., by entering a command with user input interface 46), the program guide directs control circuitry 42 to generate a video image of a program guide display screen. The information for the program guide display screen may be contained in the data provided to the program guide from data source 14 (FIG. 1) in main facility 12 (FIG. 1). This data typically contains several days worth of program listings information for the program guide.

An illustrative program listings grid 50 that may be displayed by the program guide is shown in FIG. 4. Program listings grid 50 has program listings rows 52, 54, 56, and 58. Program listings row 52 contains program listings for programs 1 and 2 on channel 2 (KJRH) during the time slots 6:30 PM, 7:00 PM, and 7:30 PM. Program listings row 54 contains program listings for programs 1 and 2 on channel 3 (HBO), etc.

Program listings grid 50 (like other program guide screens displayed by the program guide) may have a highlight region 66. Highlight region 66 may be used to highlight the current grid cell (e.g., the grid cell for the program SEINFELD in the example of FIG. 4). The range of movement of highlight region 66 is typically bounded by column 68 on the left, by program listings time cells 70 on the top, by screen boundary 72 on the right, and by lower screen boundary 74 on the bottom. Time cell 76 may be used to display the current time and date cell 77 may be used to display the current date.

The user may position highlight region 66 by entering appropriate commands with user input interface 46. For example, if user input interface 46 is a remote control such as remote control 40 of FIG. 2, the user can position highlight region 66 using arrow keys. As shown in FIG. 5, if the user repeatedly moves highlight region 66 until it reaches lower screen boundary 74, further attempts at downward movement cause the program listings to scroll in the vertical direction. In the illustrative example of FIG. 5, program listings rows 54, 56, and 58 have been moved up one position in the grid. A new program listings row 55 is displayed at the bottom of grid 50. Vertical movement of highlight region 66 in the upward direction may be used to scroll the program listings in the opposite direction.

Similarly, when highlight region 66 is panned in the horizontal direction (i.e., moved to the right or left), the listings move accordingly (i.e., to the left or right respectively). Program listings grid 50 is but one illustrative program guide screen that may be displayed by the program guide on user television equipment 22. Other program guide screens that the program guide may provide include menu screens, lists or tables of program listings, screens in which products are advertised, screens in which the current television channel is overlayed with a browse or flip region containing a program listing, television program screens without an overlay, etc. Any of these program screens and any suitable program guide features may be provided by the program guide. Moreover, any or all of

the features described may apply equally to any of the display formats described.

In a program guide display screen such as program listings grid 50, each program grid cell may  
5 contain descriptive information about a program, such as the program title, program rating, and a brief description. If the user wishes to set a reminder or schedule a recording for a program, the user may position highlight region 66 on the appropriate program  
10 listing. Once the user positions highlight region 66 on a particular program listing, the user may elect to set a reminder or schedule a recording for the program by pressing an "enter" button on remote control 40. If the "enter" button on remote control 40 is pressed, the  
15 user may be presented with a remind/record screen such as remind/record screen 70 of FIG. 6.

Remind/record screen 70 may present the user with the program title as well as the date and time the program is scheduled to air. Other components of  
20 remind/record screen 70 may be reminder option 85, record option 86, view current reminders option 87, view current recordings option 88, and cancel option 89. These options may be displayed on remind/record screen 70 whenever the user selects a program or event  
25 from program grid 50 (FIGS. 4 and 5) or from any other suitable guide screen.

If the user wishes to set a reminder to remind the user when a given program is to be broadcast, the user may position highlight region 95 of  
30 FIG. 6 onto reminder option 85 and press an "enter" button (or other similar button) on remote control 40. Alternatively, the user may position highlight region

66 on top of a desired future program listing in grid 50 (FIGS. 4 and 5) or other guide listing screen and may press "enter" (or other similar button).

Once the "enter" button on remote control 40 has been pressed, the user may be presented with a program reminder screen such as program reminder screen 90 of FIG. 7. The program reminder screen may be a full screen as shown in FIG. 7, or may use a partial screen overlay or other suitable arrangement if desired. Program reminder screen 90 contains various user-selectable options that the user may complete when setting reminder messages to remind the user when selected television programming is to be broadcast. As defined herein, such uses of the term "broadcast" refer to the process of airing television programs by traditional television broadcast techniques, cable systems, satellite systems, microwave systems, etc.

Program reminder screen 90 may provide several user-selectable options that specify when and how often the user will be reminded of the airing of selected television programs or program series. As defined herein, such uses of the term "series" refer to any set of related programs such as a program series, mini-series, sports series, pay-per-view package, etc. If the selected program is an episode of a program series, for example, program reminder screen 90 may contain episode/series reminder option 92. Episode/series reminder option 92 allows the user to either order a reminder for the currently selected episode of the program or order reminders for all episodes in the entire series. For example, if the user wishes to order a series reminder, the user may

position highlight region 95 of FIG. 7 onto the "Entire Series" selection of episode/series reminder option 92 and press an "enter" button on remote control 40.

Selecting the "Entire Series" option allows the user to  
5 order and receive reminder messages for each episode of the program series. If the series is a mini series, reminders will end after the last episode of the series. If the series is an ongoing series, reminders will continue to be displayed for the series until  
10 cancelled by the user. If the user chooses the "This episode" selection, the user may receive a reminder message for only the currently selected episode. If the selected program is a single broadcast and not an episode of a program series, the program guide will not  
15 allow the user to make a selection using episode/series reminder option 92.

In addition to episode/series reminder option 92, program reminder screen 90 may contain other user-selectable reminder options that specify when and how  
20 often the user will be reminded of the airing of the selected television program or episode. For example, program reminder screen 90 may also contain how soon option 93. How soon option 93 allows the user to indicate how soon before the broadcast of the scheduled  
25 program or episode reminder messages are to be generated and displayed to the user. As shown in FIG. 7, how soon option 93 may contain an option that allows the user to be reminded from 1 to 15 minutes (in one minute increments) or another amount of time before the  
30 selected program is broadcast. The user may make entries into how soon option 93 using remote control arrow keys to increase or decrease the desired value of



minutes, or by using remote control number keys to enter desired numerical values for the item, or by using any other suitable user interface. If "other" is selected in how soon option 93, the user is presented  
5 with screen 110 of FIG. 8, which allows the user to be reminded 1 hour, 1 day, 2 days, or to specify a desired lead time before a scheduled event by completing option 115. The user may make entries into screen 110 using remote control arrow keys to increase or decrease the  
10 desired values of days, hours, and minutes, or by using remote control number keys to enter desired numerical values for these items, or by using any other suitable user interface.

Upon completing screen 110 of FIG. 8, the  
15 user may submit the information that has been entered by selecting option 117. The user may exit page 110 without submitting the information by selecting exit option 119. If the user selects either enter option 117 or exit option 119, the user is returned to program  
20 reminder screen 90.

Alternatively, information such as how soon before the broadcast of the scheduled program or episode reminder messages are to be generated and displayed to the user may be a global default or global  
25 setting. For example, such information may be specified by the user in a set-up screen.

Program reminder screen 90 of FIG. 7 may also contain program channel option 104. Option 104 allows the user to specify which channel or channels program  
30 reminders are to be scheduled for. Option 104 may contain selections that allow the user to be reminded of program episodes airing on the selected channel, on

all channels on which the program airs, or on certain channels the program is scheduled to air on.

Typically, if the user selects the "Selected Channels" option, the user may be allowed to specify certain  
5 channel or channels program reminders are to be scheduled for.

Program reminder screen 90 of FIG. 7 may also contain program day option 107. Option 107 allows the user to specify on which days of the week program  
10 reminders are to be scheduled for. Option 107 may contain selections that allow the user to be reminded of program episodes airing on the currently selected day of the week, on all days of the week, or on certain days of the week the program episode is scheduled to  
15 air on. Typically, if the user selects the "Selected Days" option, the user may be allowed to specify certain day or days program reminders are to be scheduled for.

Program reminder screen 90 of FIG. 7 may also  
20 contain program type option 108. Option 108 allows the user to specify which type of program episodes (assuming the selected program is an episode of a program series) program reminders are to be scheduled for. For example, as shown in FIG. 7, option 108 may  
25 contain selections that allow the user to set reminders for new (i.e., first-run) episodes, rerun episodes, network episodes, syndicated episodes, only previously unviewed episodes, or all scheduled episodes whether first-run, rerun, network, syndicated, or previously  
30 unviewed.

Typically, episode/series reminder option 92, program channel option 104, program day option 107, and

program type option 108 may only be selectable by the user when the program selected from the guide is an episode of a program series. How soon option 93 may be selectable by the user regardless of whether or not the program is an episode of a program series. If the selected program is not an episode of a program series but rather is a single broadcast event, the user may set a reminder for that single broadcast and be allowed to make a selection from how soon option 93.

Similarly, if the selected program is a program series and the user wishes to set a reminder for a single episode, the user may set a reminder for that single episode and be allowed to make a selection from how soon option 93.

At any time during the completion of program reminder screen 90 (FIG. 7), the user may cancel the reminder by selecting cancel option 97. Selecting cancel option 97 returns the user to display 70 of FIG. 6 or other previous screen. The user may also deselect any previously selected option by positioning highlight region 95 on the selected option and pressing the "enter" button on remote control 40.

Upon completing program reminder screen 90, the user may set the reminder by selecting OK option 94. Selecting OK option 94 directs the program guide to process the reminder. Set-top box 28 (FIG. 2) processes and stores each reminder set by the user. The system initially searches the existing database for all programs and episodes matching the criteria specified by the user. The system will then set a reminder for each matching program or episode. Moreover, if any existing information has changed or

has been updated or if any new information has been added, the system will again examine the user criteria and set a reminder (or update or remove an existing reminder) for each new or updated program or episode.

5 The reminders are then generated by set-top box 28 and displayed on television 36 of FIG. 2 at the appropriate time. Depending on the type of television program (i.e., a series or non-series program) and the user-selectable options selected, the user may request and  
10 receive one or more reminders.

A typical series program reminder is shown in FIG. 9. The reminder is typically presented as a partial-screen overlay on top of the current television program being viewed by the user. The reminder may  
15 contain the name of the television program that the user is being reminded of (120), a reminder message indicating "DON'T FORGET," and information on when the television program is to broadcast (123). If the program is an episode of a program series, the reminder  
20 may also contain information on when the next episode is to broadcast (127). The user may hide the reminder by selecting hide option 129a. The user may immediately tune to the channel that is scheduled to show the desired program by selecting tune option 129b.  
25 An advertisement 125 (text, graphics, etc.) may be included in the reminder if desired. The advertisement may be provided using information stored in main facility 12 and transmitted to user television equipment 22 with the program guide data.

30 Moreover, the program reminder may also list all other currently active program reminders. For example, if the user receives a program reminder such

as the program reminder shown in FIG. 9, the reminder may list the program that is currently scheduled to air for which the user has received the reminder, as well as the reminder for the current television program  
5 being viewed by the user (assuming the user set a reminder for that program in the past). The list may also include any other reminders the user has set and recently received. The program reminder for the program scheduled to air next will preferably be listed  
10 first however the user may specify any other reminder order based on user preferences. The user may select any reminder from the list and may immediately tune to the channel that is showing or will show the program.

Another aspect of the invention relates to  
15 managing one's reminders. If desired, program reminder screen 90 of FIG. 7 may contain view current reminders option 98. If view current reminders option 98 is selected, (or if desired when the user selects OK option 94 of program reminder screen 90), the user may  
20 be presented with current reminders screen 130 of FIG. 10. The user may also access current reminders screen 130 by selecting view current reminders option 87 of FIG. 6 or from any other guide screen such as a menu screen. Current reminders screen 130 contains a list  
25 of all the user's currently requested reminders. Information such as program name, program episode (i.e., whether a single broadcast or an episode of a program series), type of reminder, and the date and time the request was submitted may be displayed.  
30 Typically, the entries in current reminders screen 130 are listed in chronological order based on when they are to be presented to the user. The reminder for the

episode scheduled to air next will preferably be listed first however the user may specify any other reminder order based on user preferences.

For example, a current reminder entry for the  
5 program "SEINFELD" (135) may be displayed as shown in FIG. 10. The user requested a reminder for only the selected episode of the program (i.e., not the entire series), a rerun episode, airing on July 9th on CH. 4 at 7:00 PM. This reminder was submitted on July 5,  
10 1997 at 3:04 PM and is set to remind the user one hour before the broadcast of the episode. This entry is listed first and is the first scheduled program to air.

In addition, if the user requests reminders for an entire series, that information may be displayed  
15 as well. Current reminders screen 130 may display each episode of the series scheduled to air. For example, as shown in FIG. 10, a current reminder entry for the program "THIS WEEK WITH SAM AND COKIE" (134) is displayed showing that a series reminder has been  
20 requested (133). The user will receive reminders for all scheduled episodes of the series, one day before the broadcast of each episode of the series. The next entry in the list and the next program scheduled to air is the July 10th episode of the series and is the next  
25 reminder to be presented to the user.

The user also requested a reminder for another episode of the "SEINFELD" series airing on July 14th on CH. 11 at 11:00 PM. This episode is listed next because that episode will air after the first  
30 listed episode of the series "THIS WEEK WITH SAM AND COKIE" but before the next listed episode of the series. Finally, as shown in FIG. 10, the remaining

episodes of the series "THIS WEEK WITH SAM AND COKIE" are listed and the user will receive a reminder for each scheduled episode of the series. The user may select arrow icon 132 or any other suitable icon to  
5 display and scroll through the remaining episodes of the series.

Entries may be added to the current reminders list as soon as the user sets each reminder (e.g., by selecting OK option 94 from program reminder screen 90  
10 of FIG. 7). Moreover, entries may be added to the current reminders list when the program guide automatically determines that newly scheduled program guide events match the reminder options for an existing program reminder listing. This may occur, for example,  
15 if newly added episodes are broadcast after the user has set reminders for a related series. In addition, if a schedule change is received by the program guide for any currently set reminder, the current reminder list will be updated to match the new schedule. This  
20 may prevent the user from missing a scheduled reminder due to unexpected programming schedule changes.

Moreover, the system may list series reminders set by the user even if there are no current episodes in the guide's database matching the criteria  
25 specified by the user. In addition to reminding the user the series reminder has been set, it allows the user to cancel the reminder if the user no longer wishes to be reminded of the broadcasts of that series. These reminders will preferably be located at the  
30 bottom of the list.

The user may also view and manage current reminders from elsewhere in the guide. For example,

the user may select a manage reminder option from a program guide menu screen. Selecting the option may also present the user with a current reminders listing.

In addition, the user may update or delete  
5 any currently set reminder from any program guide grid or other guide listing screen or from the current reminders listing screen. The program grid entry may, for example, indicate to the user that a reminder has been set for the program or series and allow the user  
10 to update or delete the reminder by selecting the program entry from the grid. For example, as shown in program grid 50 of FIG. 5, if a reminder is currently set for the program series "SEINFELD" (58), the grid may reflect that information by displaying a "check"  
15 mark (59) or other suitable identifying mark within the program listing entry. If the user wishes to update or delete the reminder currently set for that program series, the user may position highlight region 66 on that program listing and press an "enter" button on  
20 remote control 40. If the "enter" button on remote control 40 is pressed, the user may be presented with a program reminder update screen such as program reminder update screen 135 of FIG. 10a.

Program reminder update screen 135 of FIG.  
25 10a may display the same user-selectable options and selections the user specified when ordering the reminder from program reminder screen 90 of FIG. 7. The user may update any option by positioning highlight region 95 onto the desired selection within the option  
30 and pressing the "enter" button on remote control 40. If the selected program is an episode of a program series, program reminder update screen 135 may contain



update reminder option 132. Update reminder option 132 allows the user to either update the reminder for the currently selected episode of the series or update reminders for all episodes in the entire series.

- 5 Similarly, if the selected program is not an episode of a program series but rather is a single broadcast event, the user may update the reminder for that single broadcast by updating the how soon option which may be the only option selectable by the user. Upon  
10 completing program reminder update screen 135, the user may set the updated reminder by selecting OK option 121. After selecting OK option 121, current reminders screen 130 is updated with the new information.

- If the user wishes to cancel a current series  
15 reminder, the user may position highlight region 95 onto cancel series reminder option 124 and press enter. If the user wishes to cancel a current episode reminder, the user may position highlight region 95 onto cancel current episode reminder option 112 and  
20 press enter. Similarly, if the selected program is not an episode of a program series but rather is a single broadcast event, the user may select an option to cancel the reminder for that single broadcast. Upon selecting any cancel option, the cancelled reminder or  
25 reminders for the program, episode, or series is/are deleted from the current reminders list (130) and the user will no longer be reminded of the broadcast or broadcasts of that program or series. The user may return to program grid 50 or any other previous screen  
30 by selecting exit option 111.

Current reminders screen 130 may also indicate whether there are any conflicting reminders.

Conflicting reminders screen 130 may inform the user that two or more programs or series episodes that the user has requested reminders for are scheduled to air simultaneously (i.e., on the same day and time,  
5 partially or entirely). If the system is configured to maintain simultaneous conflicting reminders, current reminders screen 130 may not indicate to the user that there are conflicting reminders. However, displaying conflicting reminders may be preferred. For example,  
10 rather than the user receiving a reminder message such as the reminder message shown in FIG. 9, the system may instead tune to the channel showing the program when the program is scheduled to air. For example, the system may be configured to automatically tune to a  
15 program when a reminder for that program has been received (i.e., an automatically tuning reminder). In a system configured to provide automatically tuning reminders, the user or the system would need to resolve any conflicts.

20 As shown in current reminders screen 180 of FIG. 13, for example, the user has requested reminders for programs X, Y, and Z. Programs X and Z are single broadcasts while program Y is a program series. As shown in the "EPISODES" column (181) of FIG. 13, an  
25 episode of program Y is scheduled to air on the same day and time (i.e., May 3, 1997 at 8:00 PM) as program X. Accordingly, current reminders screen 180 displays a conflicting reminders message such as conflicting reminders message 183 (i.e., "CONFLICT") of FIG. 13.  
30 Program conflicts may also be displayed using other suitable techniques, such as displaying the conflicting program listings with a unique color or icon.

The user may decide to resolve the conflict before the programs are scheduled to air by cancelling one of the conflicting reminders (described below). Alternatively, the user may decide to maintain all the  
5 scheduled reminders and choose among the conflicting programs when the programs are scheduled to air. Moreover, in systems configured to provide automatically tuning reminders, the guide may resolve conflicts based on system defaults or previously  
10 specified user settings.

If the user wishes to cancel a current reminder that the user has previously set, the user may highlight the desired entry on current reminders screen 130 with highlight region 131 (as shown in FIG. 10) and  
15 press "enter" on remote control 40. If the "enter" button on remote control 40 is pressed, the user may be presented with a program reminder update screen such as program reminder update screen 135 of FIG. 10a. Once presented with program reminder update screen 135, the  
20 user may cancel a single program broadcast, a program episode, or an entire program series by selecting the appropriate option. Moreover, the user may resolve the conflict by updating a reminder using program reminder update screen 135. For example, the user may update  
25 the program channels option to resolve the conflict. If the user wishes to cancel the series reminder set for the entire series of "THIS WEEK WITH SAM AND COKIE" shown in FIG. 10, the user may position highlight region 131 on that entry under the "PROGRAM" column and  
30 press enter. After pressing enter, the user may be presented with program reminder update screen 135 from which the user may select cancel series reminder option

124. After selecting cancel option 124, the highlighted series is deleted from current reminders list 130 and the user will no longer be reminded of the broadcasts of that series. The user may return to  
5 current reminders screen 130 or any program guide menu screen by selecting exit option 139.

Another aspect of the invention relates to scheduling a program episode or program series to be recorded. If the user wishes to record a program  
10 episode or series, the user may position highlight region 95 of FIG. 6 onto record option 86 and press an enter or other similar button on remote control 40 or may press a record button on remote control 40 to record the program. If the enter button on remote  
15 control 40 is pressed, the user may be presented with a program record screen such as program record screen 140 of FIG. 11. Program record screen 140, contains various user-selectable options the user may complete when scheduling program recordings. For example,  
20 program record screen 140 may contain episode/series record option 142. Making a selection in episode/series record option 142 allows the user (if the selected program is a program series) to either schedule a recording for the currently selected episode  
25 of the program or schedule recordings for all episodes in the entire series. For example, episode/series record option 142 may allow the user the schedule recordings for an entire program series by positioning highlight region 95 and selecting the "Entire Series"  
30 option. If the user instead selects the "This episode" option, the user may schedule a recording for only the currently selected episode. If the selected program is

a single broadcast and not an episode of a program series, the user may not select an option in episode/series record option 142.

In addition to episode/series record option 5 142, program record screen 140 may also contain other user-selectable record options, provided that the selected program is a program series and the user has selected to record the entire series. These record options allow the user to specify which episodes of the 10 program series the user wishes to record. For example, program record screen 140 may contain program channel option 145, program day option 146, and program type option 147. However, these record options may not be selectable by the user if the selected program is a 15 single broadcast event or if the selected program is a program series and the user wishes to schedule a recording for a single episode of the series. At any time during completion of program record screen 140, the user may cancel the record order by selecting 20 cancel option 148. Selecting cancel option 148 returns the user to display 70 of FIG. 6 or another previous screen. The user may also access program reminder screen 90 of FIG. 10 by selecting reminders option 149. Moreover, the user may deselect any previously selected 25 option by positioning highlight region 95 on the selected option and pressing the enter button on remote control 40.

In another aspect of the invention, the information displayed in program reminder screen 90 of 30 FIG. 7 and program record screen 140 of FIG. 11 may be displayed on the same program guide screen.

Upon completing program record screen 140, the user may submit a record order for processing by selecting OK option 144. Selecting OK option 144 directs the program guide to process the request. Set-top box 28 may contain control circuitry to process and store each request submitted by the user. In a client-server architecture implementation, the processing and storing of requests may be performed at the server. The system initially searches the existing database for all programs and episodes matching the criteria specified by the user. The system will then schedule a recording for each matching program or episode. Moreover, if any existing information has changed or has been updated or if any new information has been added, the system will again examine the user criteria and schedule a recording (or update or delete an existing recording) for each new or updated program or episode. Set-top box 28 of FIG. 2 will send recording control signals to videocassette recorder 32 via line 30 to direct videocassette recorder 32 to initiate recording of the program or series episode at the proper recording time.

Another aspect of the invention relates to managing one's scheduled recordings. If desired, program record screen 140 of FIG. 11 may contain view current recordings option 143. If view current recordings option 143 is selected, the user may be presented with current recordings screen 170 of FIG. 12. Moreover, the guide may also present current recordings screen 170 when the user selects OK button 144 of program record screen 140. Current recordings screen 170, similar to current reminders screen 130 of

FIG. 10, may contain a list of all the user's currently scheduled recordings. Information such as program name, program episodes, and the date and time the request was submitted may be displayed. Current  
5 recordings screen 170 may also indicate whether the user has scheduled a recording for a single broadcast or a program series.

Entries may be added to the current recordings list as soon as the user submits each  
10 request (e.g., by selecting submit button 144 from program record screen 140 of FIG. 11). Moreover, entries may be added to the current recordings list when newly scheduled program guide events match the record options for any existing program record listing.  
15 In addition, if a schedule change is received by the program guide for any currently scheduled recording, the current recordings list will be updated to match the new schedule. This may prevent the user from missing a scheduled recording due to unexpected  
20 programming schedule changes.

Moreover, the system may list series recordings set by the user even if there are no current episodes in the guide's database matching the criteria specified by the user. In addition to reminding the  
25 user the series recording has been set, it allows the user to cancel the recording if desired. These recordings will preferably be located at the bottom of the list.

The user may also view and manage currently  
30 scheduled recordings from elsewhere in the guide. For example, the user may select a manage recording option from a program guide menu screen. Selecting the option

may also present the user with a current recordings listing.

In addition, similar to currently set reminders (as described earlier), the user may update or delete any currently scheduled recording from any program guide grid or other guide listing screen or from current recordings listing 170. The program grid entry may, for example, indicate to the user that a recording has been scheduled for the program or series and allow the user to update or delete the recording by selecting the program entry from the grid. For example, as shown in program grid 50 of FIG. 5, if a recording is currently scheduled for the program series "SEINFELD" (58), the grid may reflect that information by displaying a "check" mark (59) or other suitable identifying mark within the program listing entry (preferably a different identifying mark than one used to identify currently set reminders). If the user wishes to update or delete the recording currently scheduled for that program series, the user may position highlight region 66 on that program listing and press an "enter" button on remote control 40. If the "enter" button (or other suitable key) on remote control 40 is pressed, the user may be presented with a program recording update screen such as program recording update screen 175 of FIG. 12a.

Program recording update screen 175 of FIG. 12a, similar to program reminder update screen 135, may display the same user-selectable options and selections the user specified when scheduling the recording from program record screen 140 of FIG. 11. The user may update any option by positioning highlight region 95



onto the desired selection within the option and pressing the "enter" button on remote control 40. Upon completing program recording update screen 175, the user may schedule the updated recording by selecting OK  
5 option 173. After selecting OK option 173, current recordings screen 170 is updated with the new information.

If the user wishes to cancel a current series recording, the user may position highlight region 95  
10 onto cancel series recording option 174 and press enter. If the user wishes to cancel a current episode recording, the user may position highlight region 95 onto cancel current episode recording option 175 and press enter. Similarly, if the selected program is not  
15 an episode of a program series but rather is a single broadcast event, the user may select an option to cancel the recording for that single broadcast. After selecting any cancel option, the cancelled program, episode, or series is deleted from the current  
20 recordings list (170) and the user will no longer record that program or series. The user may return to program grid 50 or another previous screen by selecting exit option 176.

Similarly, if the user wishes to cancel a  
25 currently scheduled recording that the user has previously ordered from the current recordings list 170 of FIG. 12, the user may highlight the desired entry on current recordings screen 170 with highlight region 171 (as shown in FIG. 12) and press a remote control enter  
30 key. If the enter button on the remote control is pressed, the user may again be presented with program recording update screen 175 of FIG. 12a. The user may,

as described above, cancel or update a single program broadcast, a program episode, or an entire series from current recordings screen 170. The user may return to current recordings screen 170 by selecting exit option  
5 176.

The user may also access current reminders screen 130 of FIG. 10 by selecting view current reminders option 177 from current recordings screen 170. Moreover, the user may also arrive at current  
10 recordings screen 170 by selecting view current recordings option 88 of program information screen 70 (FIG. 6).

Current recordings screen 170 may also indicate whether there are any conflicting recordings  
15 by displaying a conflicting recordings message similar to conflicting reminders message 183 of FIG. 13. If the system allows simultaneous recordings (such as the system described in Ellis et al. U.S. patent application Serial No. \_\_\_\_\_, filed concurrently  
20 herewith (Attorney Docket No. UV-84)), the system may not indicate or display any conflicts. However, in systems where user television equipment 24 of FIG. 2 contains a single videocassette recorder, the user must resolve the conflict because a single videocassette  
25 recorder cannot support multiple simultaneous recordings.

Preferably, the program guide allows the user to resolve conflicts as soon as conflicts are detected. For example, as shown in current recordings screen 190  
30 of FIG. 14, the user has scheduled recordings for programs X, Y, and Z. Programs X and Z are single broadcasts while program Y is a program series. As

shown in the "EPISODES" column (191) of FIG. 14, an episode of program Y is scheduled to air on the same day and at the same time (i.e., May 3, 1997 at 8:00 PM) as program X. Accordingly, current recordings screen 5 190 may display a conflicting recordings message such as conflicting recordings message 194 (i.e., "CONFLICT") of FIG. 14. Program conflicts may also be displayed using other suitable techniques, such as displaying the conflicting programs with a unique color 10 or icon, etc. The user may be allowed to resolve the conflict by selecting resolve conflicts option 193 of FIG. 14. If the user selects resolve conflicts button 193, the user may be presented with resolve conflicts screen 210 of FIG. 15.

15 In another aspect of the invention, the user may be notified of a conflict and allowed to resolve the conflict from the same program guide screen.

As shown in FIG. 15, resolve conflicts screen 210 may display the program names, the date and time 20 the recording request was submitted, and the date and time of the detected conflict. Resolve conflicts screen 210 may allow the user to choose which of the conflicting programs or episodes are to be recorded. For example, as shown in FIG. 15, conflicting programs 25 X and Y are listed. Although program Y is a scheduled program series to be recorded, only the conflicting program episode is listed. Program X is listed first and assumed preferred by the user over program episode Y because its request was submitted most recently by 30 the user. While the program listing order represents recording priority, the system may or may not record programs based on the program listing order. Resolve

conflicts screen 210 may list conflicting programs based on other possible user designated criteria such as program start times, channel numbers, single episodes over series, etc., or may list conflicting programs based the system's own priority scheme. Accordingly, other scheduled programs or episodes in the list may, for example, have a line drawn through them to indicate they are not preferred by the user and that their scheduled recordings are to be deleted or updated. For example, as shown in FIG. 15, program episode Y has a line drawn through it and that scheduled recording may be deleted or updated if the program listing is selected. If the program listing is selected, the user may be presented with program recording update screen 175 of FIG. 12a. The user may, as described earlier, cancel the conflicting program, series episode, or series. The user may also, if desired, resolve the conflict by updating the conflicting recording from recording update screen 175. If the user deletes the entry for program episode Y, the user may not record that episode but the scheduled recording for all other episodes of that program series will remain. In addition, the user may do nothing whereby the guide will resolve the conflict based on system or user default settings (e.g., record program X).

However, if the user would rather cancel or update the scheduled recording of program X and retain the scheduled recording of program episode Y, the user may position highlight region 212 on the program episode X entry and press the enter button on remote control 40. This allows the user to be presented with

program recording update screen 175 for program episode X where the user may cancel or update the episode or series. This may cause program episode Y to be listed first and program X to be listed next with a line drawn through it indicating that that entry has been deleted or updated, as shown in FIG. 16. The user, once the conflict is resolved, may return to current recordings screen 190 or another previous screen by selecting exit option 214.

10               While the program guide allows the user to resolve conflicts as soon as conflicts are detected, a user may decide not to resolve a conflict once one is detected. Furthermore, the program guide may not detect a conflict immediately after the user submits a recording request to be processed, but may detect a conflict at a later time when the user may or may not be in the program guide. The latter situation may arise, for example, if new program information in the database is added or existing information is updated since the user last submitted a request.

20               The program guide may allow the user to resolve any future conflicts detected by the guide by notifying the user of the conflicts as soon as they are detected. The program guide may display a conflicting recordings message such as conflicting recordings message 194 of FIG. 14 or may display resolve conflicts screen 210 of FIG. 15. The user may resolve the conflict by selecting resolve conflicts option 193 of FIG. 14. If the user selects resolve conflicts button 30 193, the user may be presented with resolve conflicts screen 210 of FIG. 15 and allowed to resolve the conflict as discussed previously. If the user is not

in the guide when a conflict is detected, the user may be presented with resolve conflicts screen 210 or any other suitable conflicting recordings message and allowed to resolve the conflict as soon as the user  
5 enters the guide or at any other time specified by the user.

However, if the user does not resolve the conflict, the program guide may resolve the conflict based on its own preference scheme. The approach used  
10 by the guide may be based on global system defaults or settings or may be specified by the user (e.g., by completing a set-up screen when the user first enters the guide).

The guide may, for example, record the  
15 program listed first in resolve conflicts screen 210 of FIG. 15 and reject the remaining programs in conflict. The program listed first is assumed preferred by the user because its recording request was submitted most recently by the user. However, the guide may use other  
20 criteria in deciding which program to record such as program start times, channel numbers, or any other suitable priority scheme. The criteria may be specified by the user or programmed as global defaults. The guide may allow the user to view the program  
25 selection as well as approve or change the selection at any time before the conflicting programs or episodes are scheduled to air. This may be accomplished, for example, from current recordings screen 190 of FIG. 14 or from any other suitable recording screen.

30 The guide may resolve conflicts by recording the program listed first in resolve conflicts screen 210 (or any other preferred listed program based on

user-specified or system criteria) and record the remaining portion (if any) of the next preferred program in the list. The guide may allow the user to view the program selections as well as the recording  
5 sequence and may allow the user to approve or change the selections and/or recording sequence at any time before the programs are scheduled to air. This may again be accomplished, for example, from current recordings screen 190 of FIG. 14 or from any other  
10 suitable recording screen.

In another aspect of the invention, currently set reminders and currently scheduled recordings may be listed and displayed on the same program guide screen. Moreover, the user may be notified of conflicting  
15 reminders and recordings from the same program guide screen and allowed to resolve all conflicts simultaneously using any or all of the principles discussed. However, if the system is configured to allow the user to record a program while viewing a  
20 different program and thus allow the user to receive a reminder message, the system may not notify the user of conflicts or may not allow the user to resolve conflicts. Further features of an illustrative interactive television program guide with simultaneous  
25 watch and record capabilities are described in Lemmons et al. U.S. patent application Serial No. \_\_\_\_\_, filed concurrently herewith (Attorney Docket No. UV-67), which is hereby incorporated by reference herein in its entirety.

30 FIG. 17 is a diagram showing the interrelationship of the illustrative program guide screens used to provide the features of the invention.

The features can initially be accessed from any program guide display screen such as program listings grid 50 of FIG. 5 or while watching television. When the user selects a given television program, remind/record  
5 screen 70 of FIG. 6 displays reminder option 85, record option 86, view current reminders option 87, and view current recordings option 88. View current reminders option 87, and view current recordings option 88 may also be accessed from elsewhere in the guide such as a  
10 guide menu screen. Selecting the reminder option 85 from remind/record screen 70 takes the user to program reminder screen 90 of FIG. 7 or to program reminder update screen 135 of FIG. 10a. Program reminder screen 90 may provide the user with several options to specify  
15 when and how often the user will be reminded of the airing of selected television programs or program series. The user may also reach program reminder screen 90 from program record screen 140 of FIG. 11 by selecting reminder option 149 or from any program guide  
20 display screen or from watching television.

The user may also access view, update, or cancel any existing set reminders or scheduled recordings by selecting a television program from a program guide display screen or from remind/record  
25 screen of FIG. 6. If the user selects a television program from a program guide display screen which has an existing reminder or scheduled recording, the user may be presented with program reminder update screen of FIG. 10a or program recording update screen of FIG.  
30 12a.

The user may also access current reminders screen 130 of FIG. 10 by selecting view current



reminders option 87 of FIG. 6 or from somewhere else in the guide such as a main menu screen. Once the user submits a reminder order, the reminder or reminders are added to (and the user may be presented with) current  
5 reminders screen 130. The user may also access current reminders screen 130 from program reminder screen 90 of FIG. 7 by selecting view current reminders option 98 or from current recordings screen 170 of FIG. 12 by selecting view current reminders option 177. While at  
10 current reminders screen 130, the user may view all current reminders and may delete or update any reminder which is no longer desired. The user may also view any reminder conflicts and may resolve the conflicts or decide to choose among the conflicting events when the  
15 scheduled programs air.

Selecting record option 86 from remind/record screen 70 of FIG. 6 takes the user to program record screen 140 of FIG. 11 or to program recording update screen of FIG. 12a. Program record screen 140 may  
20 provide the user with several options to complete when scheduling program recordings. The user may also reach program record screen 140 from program reminder screen 90 of FIG. 7 by selecting record option 96 or from any program display screen or from watching television.

25 The user may also access current recordings screen 170 of FIG. 12 by selecting view current recordings option 88 of FIG. 6 or from somewhere else in the guide such as a main menu screen. Once the user submits a request to schedule a recording, the  
30 scheduled recording or recordings are added to (and the user may be presented with) current recordings screen 170. The user may also access current recordings

screen 170 from program recording screen 140 of FIG. 11 by selecting view current recordings option 143 or from current reminders screen 130 of FIG. 10 by selecting view current recordings option 137. While at current  
5 recordings screen 170, the user may view all currently scheduled recordings and may delete or update any scheduled recording which is no longer desired. The user may also view any recording conflicts and preferably may resolve any conflicts when they are  
10 detected. The user may resolve recording conflicts from resolve conflicts screen 210 of FIG. 15 by selecting resolve conflicts option 193 of current recordings screen 190 of FIG. 14 and may view or resolve conflicts from current recordings screen of  
15 FIG. 12. The user may also view and resolve conflicts between currently set reminders and currently scheduled recordings from the same program guide screen. The guide may or may not display conflicts depending on the capabilities of the system.

20           The foregoing is merely illustrative of the principles of this invention and various modifications can be made by those skilled in the art without departing from the scope and spirit of the invention.

What is Claimed is:

1. An interactive television program guide system in which television programs are displayed on user television equipment of a plurality of users comprising:

means for allowing a user to select an option that sets program reminders for each of the programs that are part of a given series; and

means for automatically displaying individual reminders on the user television equipment of the user for each television program in that series.

2. The interactive television program guide system defined in claim 1 wherein the means for displaying comprises means for displaying a partial screen overlay reminder message for each television program in the series.

3. The interactive television program guide system defined in claim 1 wherein the means for displaying comprises means for displaying a reminder message on a program guide display screen for each television program in the series.

4. The interactive television program guide system defined in claim 3 wherein the means for displaying the reminder message further comprises means for hiding the reminder message.

5. The interactive television program guide system defined in claim 1 wherein the means for setting the reminder message comprises means for automatically

tuning to a channel that is scheduled to show the television program.

6. The interactive television program guide system defined in claim 2 wherein the means for displaying the reminder message comprises means for automatically tuning to a channel that is scheduled to show the television program.

7. The interactive television program guide system defined in claim 1 further comprising a television distribution facility for distributing the television programs to the user television equipment and for distributing television program listings to the user television equipment.

8. The interactive television program guide system defined in claim 7 wherein the television distribution facility comprises a server on which an interactive television program guide is at least partially implemented.

9. The interactive television program guide system defined in claim 1 further comprising means for selecting a television program.

10. The interactive television program guide system defined in claim 9 further comprising means for displaying a remind/record screen based on the television program selection.

11. The interactive television program guide system defined in claim 10 further comprising means for displaying a reminder option on the remind/record screen which the user selects to set television program series reminders.

12. The interactive television program guide system defined in claim 11 further comprising means for displaying a reminder options screen on the user television equipment when the user selects the reminder option.

13. The interactive television program guide system defined in claim 9 further comprising means for displaying a reminder options screen on the user television equipment when the user selects the television program.

14. The interactive television program guide system defined in claim 12 further comprising means for displaying reminder options on the reminder options screen.

15. The interactive television program guide system defined in claim 12 further comprising means for displaying a record option on the reminder options screen.

16. The interactive television program guide system defined in claim 1 further comprising means for displaying an option to schedule a reminder for a single episode of a series.

17. The interactive television program guide system defined in claim 1 further comprising means for displaying an option to schedule a reminder for a given program at different lengths of time before the scheduled broadcast time of that program.

18. The interactive television program guide system defined in claim 1 further comprising means for displaying an option to schedule a reminder for given programs which are part of the series on specific channels on which the programs are to be broadcast.

19. The interactive television program guide system defined in claim 1 further comprising means for displaying an option to schedule a reminder for given programs which are part of the series on all channels on which the programs are to be broadcast.

20. The interactive television program guide system defined in claim 1 further comprising means for displaying an option to schedule a reminder for given programs which are part of the series on specific days of the week on which the programs are to be broadcast.

~~21. The interactive television program guide~~  
system defined in claim 1 further comprising means for displaying an option to schedule a reminder for given programs which are part of the series on all days of the week on which the programs are to be broadcast.

22. The interactive television program guide system defined in claim 1 further comprising means for

displaying an option to schedule a reminder for first-run broadcasts of given programs which are part of the series.

23. The interactive television program guide system defined in claim 1 further comprising means for displaying an option to schedule a reminder for rerun broadcasts of given programs which are part of the series.

24. The interactive television program guide system defined in claim 1 further comprising means for displaying an option to schedule a reminder for network broadcasts of given programs which are part of the series.

25. The interactive television program guide system defined in claim 1 further comprising means for displaying an option to schedule a reminder for syndicated broadcasts of given programs which are part of the series.

26. The interactive television program guide system defined in claim 1 further comprising means for displaying an option to schedule a reminder for previously unviewed broadcasts of given programs which are part of the series.

27. The interactive television program guide system defined in claim 1 further comprising means for displaying an option to schedule a reminder for all rerun, first-run, network, syndicated, and previously

unviewed broadcasts of given programs which are part of the series.

28. The interactive television program guide system defined in claim 1 further comprising means for displaying a view current reminders option which the user selects to receive a list of current reminder orders.

29. The interactive television program guide system defined in claim 28 wherein the means for displaying a view current reminders option further comprises means for displaying a view current reminders screen on the user television equipment when the user selects the view current reminders option.

30. The interactive television program guide system defined in claim 28 further comprising means for displaying the view current reminders option on a reminder options screen.

31. The interactive television program guide system defined in claim 28 further comprising means for displaying the view current reminders option on a remind/record screen.

32. The interactive television program guide system defined in claim 28 further comprising means for displaying the view current reminders option on a program guide menu screen.



33. The interactive television program guide system defined in claim 1 further comprising means for displaying a program reminder update screen.

34. The interactive television program guide system defined in claim 9 wherein the means for selecting the television program further comprises means for displaying a program reminder update screen.

35. The interactive television program guide system defined in claim 29 wherein the means for displaying the view current reminders screen further comprises means for displaying a program reminder update screen.

36. The interactive television program guide system defined in claim 33 further comprising means for deleting a reminder order.

37. The interactive television program guide system defined in claim 33 further comprising means for updating a reminder order.

38. The interactive television program guide system defined in claim 36 further comprising means for deleting a single episode reminder order.

39. The interactive television program guide system defined in claim 36 further comprising means for deleting an entire series reminder order.

40. The interactive television program guide system defined in claim 1 further comprising means for displaying conflicting reminders.

41. The interactive television program guide system defined in claim 1 further comprising means for not displaying conflicting reminders if the system supports simultaneous reminders.

42. The interactive television program guide system defined in claim 1 further comprising means for allowing the user to resolve conflicts between reminders.

43. An interactive television program guide system in which television programs are displayed on user television equipment of a plurality of users comprising:

means for allowing a user to select an option that schedules program recordings for each of the programs that are part of a given series; and

means for automatically recording each television program in the series.

44. The interactive television program guide system defined in claim 43 further comprising means for recording using the user television equipment.

45. The interactive television program guide system defined in claim 43 further comprising means for recording on a server.

46. The interactive television program guide system defined in claim 43 further comprising a television distribution facility for distributing the television programs to the user television equipment and for distributing television program listings to the user television equipment.

47. The interactive television program guide system defined in claim 46 wherein the television distribution facility comprises a server on which an interactive television program guide is at least partially implemented.

48. The interactive television program guide system defined in claim 43 further comprising means for selecting a television program.

49. The interactive television program guide system defined in claim 48 further comprising means for displaying a remind/record screen based on the television program selection.

50. The interactive television program guide system defined in claim 49 further comprising means for displaying a record option on the remind/record screen which the user selects to schedule television program series recordings.

51. The interactive television program guide system defined in claim 50 further comprising means for displaying a recording options screen on the user

television equipment when the user selects the record option.

52. The interactive television program guide system defined in claim 48 further comprising means for displaying a recording options screen on the user television equipment when the user selects the television program.

53. The interactive television program guide system defined in claim 51 further comprising means for displaying recording options on the recording options screen.

54. The interactive television program guide system defined in claim 51 further comprising means for displaying a reminder option on the recording options screen.

55. The interactive television program guide system defined in claim 43 further comprising means for displaying an option to schedule a recording for a single episode of a series.

56. The interactive television program guide system defined in claim 43 further comprising means for displaying an option to schedule a recording for given programs which are part of the series on specific channels on which the program is to be broadcast.

57. The interactive television program guide system defined in claim 43 further comprising means for

displaying an option to schedule a recording for given programs which are part of the series on all channels on which the program is to be broadcast.

58. The interactive television program guide system defined in claim 43 further comprising means for displaying an option to schedule a recording for given programs which are part of the series on specific days of the week on which the program is to be broadcast.

59. The interactive television program guide system defined in claim 43 further comprising means for displaying an option to schedule a recording for given programs which are part of the series on all days of the week on which the program is to be broadcast.

60. The interactive television program guide system defined in claim 43 further comprising means for displaying an option to schedule a recording for first-run broadcasts of given programs which are part of the series.

61. The interactive television program guide system defined in claim 43 further comprising means for displaying an option to schedule a recording for rerun broadcasts of given programs which are part of the series.

62. The interactive television program guide system defined in claim 43 further comprising means for displaying an option to schedule a recording for

network broadcasts of given programs which are part of the series.

63. The interactive television program guide system defined in claim 43 further comprising means for displaying an option to schedule a recording for syndicated broadcasts of given programs which are part of the series.

64. The interactive television program guide system defined in claim 43 further comprising means for displaying an option to schedule a recording for previously unrecorded broadcasts of given programs which are part of the series.

65. The interactive television program guide system defined in claim 43 further comprising means for displaying an option to schedule a recording for all rerun, first-run, network, syndicated, and previously unrecorded broadcasts of given programs which are part of the series.

66. The interactive television program guide system defined in claim 43 further comprising means for displaying a view current recordings option which the user selects to receive a list of current scheduled recordings.

67. The interactive television program guide system defined in claim 66 wherein the means for displaying a view current recordings option further comprises means for displaying a view current

recordings screen on the user television equipment when the user selects the view current recordings option.

68. The interactive television program guide system defined in claim 66 further comprising means for displaying the view current recordings option on a recording options screen.

69. The interactive television program guide system defined in claim 66 further comprising means for displaying the view current recordings option on a remind/record screen.

70. The interactive television program guide system defined in claim 66 further comprising means for displaying the view current recordings option on a program guide menu screen.

71. The interactive television program guide system defined in claim 43 further comprising means for displaying a program recording update screen.

72. The interactive television program guide system defined in claim 48 wherein the means for selecting the television program further comprising means for displaying a program recording update screen.

73. The interactive television program guide system defined in claim 67 wherein the means for displaying the view current recordings screen further comprising means for displaying a program recording update screen.

74. The interactive television program guide system defined in claim 71 further comprising means for deleting a scheduled recording.

75. The interactive television program guide system defined in claim 71 further comprising means for updating a scheduled recording.

76. The interactive television program guide system defined in claim 74 further comprising means for deleting a single episode scheduled recording.

77. The interactive television program guide system defined in claim 74 further comprising means for deleting an entire series scheduled recording.

78. The interactive television program guide system defined in claim 43 further comprising means for displaying conflicting recordings.

79. The interactive television program guide system defined in claim 43 further comprising means for not displaying conflicting recordings if the system supports simultaneous recordings.

80. The interactive television program guide system defined in claim 43 further comprising means for allowing the user to resolve conflicts between scheduled recordings.

81. The interactive television program guide system defined in claim 43 further comprising means for



allowing the system to resolve conflicts between scheduled recordings.

82. The interactive television program guide system defined in claim 43 further comprising means for displaying scheduled recordings and scheduled reminders on a program guide screen.

83. The interactive television program guide system defined in claim 82 further comprising means for displaying conflicts between recordings and reminders.

84. The interactive television program guide system defined in claim 82 further comprising means for not displaying conflicts between recordings and reminders if the system supports simultaneous watch and record.

85. The interactive television program guide system defined in claim 82 further comprising means for allowing the user to resolve conflicts between recordings and reminders.

86. A method for displaying television programs on user television equipment of a plurality of users, comprising the steps of:

allowing a user to select an option that sets program reminders for each of the programs that are part of a given series; and

automatically displaying individual reminders on the user television equipment of the user for each television program in that series.

87. The method defined in claim 86 wherein the step of displaying comprises the step of displaying a partial screen overlay reminder message for each television program in the series.

88. The method defined in claim 86 wherein the step of displaying comprises the step of displaying a reminder message on a program guide display screen for each television program in the series.

89. The method defined in claim 88 wherein the step of displaying the reminder message further comprises the step of hiding the reminder message.

90. The method defined in claim 87 wherein the step of setting the reminder message comprises the step of automatically tuning to a channel that is scheduled to show the television program.

91. The method defined in claim 87 wherein the step of displaying the reminder message comprises the step of automatically tuning to a channel that is scheduled to show the television program.

92. The method defined in claim 86 further comprising the step of distributing the television programs to the user television equipment and the step of distributing television program listings to the user television equipment.

93. The method defined in claim 86 further comprising the step of selecting a television program.

94. The method defined in claim 93 further comprising the step of displaying a remind/record screen based on the television program selection.

95. The method defined in claim 94 further comprising the step of displaying a reminder option on the remind/record screen which the user selects to set television program series reminders.

96. The method defined in claim 95 further comprising the step of displaying a reminder options screen on the user television equipment when the user selects the reminder option.

97. The method defined in claim 93 further comprising the step of displaying a reminder options screen on the user television equipment when the user selects the television program.

98. The method defined in claim 96 further comprising the step of displaying reminder options on the reminder options screen.

99. The method defined in claim 96 further comprising the step of displaying a record option on the reminder options screen.

100. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for a single episode of a series.

101. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for a given program at different lengths of time before the scheduled broadcast time of that program.

102. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for given programs which are part of the series on specific channels on which the program is to be broadcast.

103. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for given programs which are part of the series on all channels on which the program is to be broadcast.

104. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for given programs which are part of the series on specific days of the week on which the program is to be broadcast.

105. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for given programs which are part of the series on all days of the week on which the program is to be broadcast.

106. The method defined in claim 86 further comprising the step of displaying an option to schedule

a reminder for first-run broadcasts of given programs which are part of the series.

107. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for rerun broadcasts of given programs which are part of the series.

108. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for network broadcasts of given programs which are part of the series.

109. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for syndicated broadcasts of given programs which are part of the series.

110. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for previously unviewed broadcasts of given programs which are part of the series.

111. The method defined in claim 86 further comprising the step of displaying an option to schedule a reminder for all rerun, first-run, network, syndicated, and previously unviewed broadcasts of given programs which are part of the series.

112. The method defined in claim 86 further comprising the step of displaying a view current

reminders option which the user selects to receive a list of current reminder orders.

113. The method defined in claim 112 wherein the step of displaying a view current reminders option further comprises the step of displaying a view current reminders screen on the user television equipment when the user selects the view current reminders option.

114. The method defined in claim 112 further comprising the step of displaying the view current reminders option on a reminder options screen.

115. The method defined in claim 112 further comprising the step of displaying the view current reminders option on a remind/record screen.

116. The method defined in claim 112 further comprising the step of displaying the view current reminders option on a program guide menu screen.

117. The method defined in claim 86 further comprising the step of displaying a program reminder update screen.

118. The method defined in claim 93 wherein the step of selecting a television program further comprises the step of displaying a program reminder update screen.

119. The method defined in claim 113 wherein the step of displaying the view current reminders

screen further comprises the step of displaying a program reminder update screen.

120. The method defined in claim 117 further comprising the step of deleting a reminder order.

121. The method defined in claim 117 further comprising the step of updating a reminder order.

122. The method defined in claim 120 further comprising the step of deleting a single episode reminder order.

123. The method defined in claim 120 further comprising the step of deleting an entire series reminder order.

124. The method defined in claim 86 further comprising the step of displaying conflicting reminders.

125. The method defined in claim 86 further comprising the step of not displaying conflicting reminders if the system supports simultaneous reminders.

126. The method defined in claim 86 further comprising the step of allowing the user to resolve conflicts between reminders.

127. A method for displaying television programs on user television equipment of a plurality of users, comprising the steps of:

allowing a user to select an option that schedules program recordings for each of the programs that are part of a given series; and

automatically recording each television program in the series.

128. The method defined in claim 127 further comprising the step of recording using the user television equipment.

129. The method defined in claim 127 further comprising the step of recording on a server.

130. The method defined in claim 127 further comprising the step of distributing the television programs to the user television equipment and the step of distributing television program listings to the user television equipment.

131. The method defined in claim 127 further comprising the step of selecting a television program.

132. The method defined in claim 131 further comprising the step of displaying a remind/record screen based on the television program selection.

133. The method defined in claim 132 further comprising the step of displaying a record option on



the remind/record screen which the user selects to schedule television program series recordings.

134. The method defined in claim 133 further comprising the step of displaying a recording options screen on the user television equipment when the user selects the record option.

135. The method defined in claim 131 further comprising the step of displaying a recording options screen on the user television equipment when the user selects the television program.

136. The method defined in claim 134 further comprising the step of displaying recording options on the recording options screen.

137. The method defined in claim 134 further comprising the step of displaying a reminder option on the recording options screen.

138. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for a single episode of a series.

139. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for given programs which are part of the series on specific channels on which the program is to be broadcast.

140. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for given programs which are part of the series on all channels on which the program is to be broadcast.

141. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for given programs which are part of the series on specific days of the week on which the program is to be broadcast.

142. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for given programs which are part of the series on all days of the week on which the program is to be broadcast.

143. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for first-run broadcasts of given programs which are part of the series.

144. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for rerun broadcasts of given programs which are part of the series.

145. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for network broadcasts of given programs which are part of the series.

146. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for syndicated broadcasts of given programs which are part of the series.

147. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for previously unrecorded broadcasts of given programs which are part of the series.

148. The method defined in claim 127 further comprising the step of displaying an option to schedule a recording for all rerun, first-run, network, syndicated, and previously unrecorded broadcasts of given programs which are part of the series.

149. The method defined in claim 127 further comprising the step of displaying a view current recordings option which the user selects to receive a list of current scheduled recordings.

150. The method defined in claim 149 wherein the step of displaying a view current recordings option further comprises the step of displaying a view current recordings screen on the user television equipment when the user selects the view current recordings option.

151. The method defined in claim 149 further comprising the step of displaying the view current recordings option on a recording options screen.

152. The method defined in claim 149 further comprising the step of displaying the view current recordings option on a remind/record screen.

153. The method defined in claim 149 further comprising the step of displaying the view current recordings option on a program guide menu screen.

154. The method defined in claim 127 further comprising the step of displaying a program recording update screen.

155. The method defined in claim 131 wherein the step of selecting a television program further comprises the step of displaying a program recording update screen.

156. The method defined in claim 150 wherein the step of displaying the view current recordings screen further comprises the step of displaying a program recording update screen.

157. The method defined in claim 154 further comprising the step of deleting a scheduled recording.

158. The method defined in claim 154 further comprising the step of updating a scheduled recording.

159. The method defined in claim 157 further comprising the step of deleting a single episode scheduled recording.

160. The method defined in claim 157 further comprising the step of deleting an entire series scheduled recording.

161. The method defined in claim 127 further comprising the step of displaying conflicting recordings.

162. The method defined in claim 127 further comprising the step of not displaying conflicting recordings if the system supports simultaneous recordings.

163. The method defined in claim 127 further comprising the step of allowing the user to resolve conflicts between scheduled recordings.

164. The method defined in claim 127 further comprising the step of allowing the system to resolve conflicts between scheduled recordings.

165. The method defined in claim 127 further comprising the step of displaying scheduled recordings and scheduled reminders on a program guide screen.

166. The method defined in claim 165 further comprising the step of displaying conflicts between recordings and reminders.

167. The method defined in claim 165 further comprising the step of not displaying conflicts between

recordings and reminders if the system supports simultaneous watch and record.

168. The method defined in claim 165 further comprising the step of allowing the user to resolve conflicts between recordings and reminders.

169. A system in which television programs are displayed on user television equipment of a plurality of users comprising:

- a television distribution facility configured to provide the television programs;
- user television equipment that receives the television programs from the television distribution facility, wherein the user television equipment and television distribution facility are configured to:

- allow a user to select an option that sets program reminders for each of the programs that are part of a given series; and

- automatically display individual reminders on the user television equipment of the user for each television program in that series.

170. The system defined in claim 169 wherein the user television equipment and television distribution facility are further configured to display a partial screen overlay reminder message for each television program in the series.

171. The system defined in claim 169 wherein the user television equipment and television

distribution facility are further configured to display a reminder message on a program guide display screen for each television program in the series.

172. The system defined in claim 171 wherein the user television equipment and television distribution facility are further configured to hide the reminder message.

173. The system defined in claim 170 wherein the user television equipment and television distribution facility are further configured to automatically tune to a channel that is scheduled to show the television program.

174. The system defined in claim 169 further comprising a television distribution facility for distributing the television programs to the user television equipment and for distributing television program listings to the user television equipment.

175. The system defined in claim 174 wherein the television distribution facility comprises a server on which an interactive television program guide is at least partially implemented.

176. The system defined in claim 169 wherein the user television equipment and television distribution facility are configured to allow the user to select a television program.

177. The system defined in claim 176 further configured to display a remind/record screen based on the television program selection.

178. The system defined in claim 177 further configured to display a reminder option on the remind/record screen which the user selects to set television program series reminders.

179. The system defined in claim 178 further configured to display a reminder options screen on the user television equipment when the user selects the reminder option.

180. The system defined in claim 176 further configured to display a reminder options screen on the user television equipment when the user selects the television program.

181. The system defined in claim 179 further configured to display reminder options on the reminder options screen.

182. The system defined in claim 179 further configured to display a record option on the reminder options screen.

183. The system defined in claim 169 further configured to display an option to schedule a reminder for a single episode of a series.



184. The system defined in claim 169 further configured to display an option to schedule a reminder for a given program at different lengths of time before the scheduled broadcast time of that program.

185. The system defined in claim 169 further configured to display an option to schedule a reminder for given programs which are part of the series on specific channels on which the program is to be broadcast.

186. The system defined in claim 169 further configured to display an option to schedule a reminder for given programs which are part of the series on all channels on which the program is to be broadcast.

187. The system defined in claim 169 further configured to display an option to schedule a reminder for given programs which are part of the series on specific days of the week on which the program is to be broadcast.

188. The system defined in claim 169 further configured to display an option to schedule a reminder for given programs which are part of the series on all days of the week on which the program is to be broadcast.

189. The system defined in claim 169 further configured to display an option to schedule a reminder for first-run broadcasts of given programs which are part of the series.

190. The system defined in claim 169 further configured to display an option to schedule a reminder for rerun broadcasts of given programs which are part of the series.

191. The system defined in claim 169 further configured to display an option to schedule a reminder for network broadcasts of given programs which are part of the series.

192. The system defined in claim 169 further configured to display an option to schedule a reminder for syndicated broadcasts of given programs which are part of the series.

193. The system defined in claim 169 further configured to display an option to schedule a reminder for previously unviewed broadcasts of given programs which are part of the series.

194. The system defined in claim 169 further configured to display an option to schedule a reminder for all rerun, first-run, network, syndicated, and previously unviewed broadcasts of given programs which are part of the series.

195. The system defined in claim 169 further configured to display a view current reminders option which the user selects to receive a list of current reminder orders.

196. The system defined in claim 195 further configured to display a view current reminders screen on the user television equipment when the user selects the view current reminders option.

197. The system defined in claim 195 further configured to display the view current reminders option on a reminder options screen.

198. The system defined in claim 195 further configured to display the view current reminders option on a remind/record screen.

199. The system defined in claim 195 further configured to display the view current reminders option on a program guide menu screen.

200. The system defined in claim 169 further configured to display a program reminder update screen.

201. The system defined in claim 176 further configured to display a program reminder update screen.

202. The system defined in claim 196 further configured to display a program reminder update screen.

203. The system defined in claim 200 further configured to allow the user to delete a reminder order.

204. The system defined in claim 200 further configured to allow the user to update a reminder order.

205. The system defined in claim 203 further configured to allow the user to delete a single episode reminder order.

206. The system defined in claim 203 further configured to allow the user to delete an entire series reminder order.

207. The system defined in claim 169 further configured to display conflicting reminders.

208. The system defined in claim 169 further configured not to display conflicting reminders if the system supports simultaneous reminders.

209. The system defined in claim 169 further configured to allow the user to resolve conflicts between reminders.

210. A system in which television programs are displayed on user television equipment of a plurality of users comprising:

- a television distribution facility configured to provide the television programs;
- user television equipment that receives the television programs from the television distribution facility, wherein the user television

equipment and television distribution facility are configured to:

allow a user to select an option that schedules program recordings for each of the programs that are part of a given series; and  
automatically record each television program in the series.

211. The system defined in claim 210 further configured to record using the user television equipment.

212. The system defined in claim 210 further configured to record using a server.

213. The system defined in claim 210 further comprising a television distribution facility for distributing the television programs to the user television equipment and for distributing television program listings to the user television equipment.

214. The system defined in claim 213 wherein the television distribution facility comprises a server on which an interactive television program guide is at least partially implemented.

215. The system defined in claim 210 further configured to allow the user to select a television program.

216. The system defined in claim 215 further configured to display a remind/record screen based on the television program selection.

217. The system defined in claim 216 further configured to display a record option on the remind/record screen which the user selects to schedule television program series recordings.

218. The system defined in claim 217 further configured to display a recording options screen on the user television equipment when the user selects the record option.

219. The system defined in claim 215 further configured to display a recording options screen on the user television equipment when the user selects the television program.

220. The system defined in claim 218 further configured to display recording options on the recording options screen.

221. The system defined in claim 218 further configured to display a reminder option on the recording options screen.

222. The system defined in claim 210 further configured to display an option to schedule a recording for a single episode of a series.

223. The system defined in claim 210 further configured to display an option to schedule a recording for given programs which are part of the series on specific channels on which the program is to be broadcast.

224. The system defined in claim 210 further configured to display an option to schedule a recording for given programs which are part of the series on all channels on which the program is to be broadcast.

225. The system defined in claim 210 further configured to display an option to schedule a recording for given programs which are part of the series on specific days of the week on which the program is to be broadcast.

226. The system defined in claim 210 further configured to display an option to schedule a recording for given programs which are part of the series on all days of the week on which the program is to be broadcast.

227. The system defined in claim 210 further configured to display an option to schedule a recording for first-run broadcasts of given programs which are part of the series.

228. The system defined in claim 210 further configured to display an option to schedule a recording for rerun broadcasts of given programs which are part of the series.

229. The system defined in claim 210 further configured to display an option to schedule a recording for network broadcasts of given programs which are part of the series.

230. The system defined in claim 210 further configured to display an option to schedule a recording for syndicated broadcasts of given programs which are part of the series.

231. The system defined in claim 210 further configured to display an option to schedule a recording for previously unrecorded broadcasts of given programs which are part of the series.

232. The system defined in claim 210 further configured to display an option to schedule a recording for all rerun, first-run, network, syndicated, and previously unrecorded broadcasts of given programs which are part of the series.

233. The system defined in claim 210 further configured to display a view current recordings option which the user selects to receive a list of current scheduled recordings.

234. The system defined in claim 233 further configured to display a view current recordings screen on the user television equipment when the user selects the view current recordings option.



235. The system defined in claim 233 further configured to display the view current recordings option on a recording options screen.

236. The system defined in claim 233 further configured to display the view current recordings option on a remind/record screen.

237. The system defined in claim 233 further configured to display the view current recordings option on a program guide menu screen.

238. The system defined in claim 210 further configured to display a program recording update screen.

239. The system defined in claim 215 further configured to display a program recording update screen.

240. The system defined in claim 234 further configured to display a program recording update screen.

241. The system defined in claim 238 further configured to allow the user to delete a scheduled recording.

242. The system defined in claim 238 further configured to allow the user to update a scheduled recording.

243. The system defined in claim 241 further configured to allow the user to delete a single episode scheduled recording.

244. The system defined in claim 241 further configured to allow the user to delete an entire series scheduled recording.

245. The system defined in claim 210 further configured to display conflicting recordings.

246. The system defined in claim 210 further configured not to display conflicting recordings if the system supports simultaneous recordings.

247. The system defined in claim 210 further configured to allow the user to resolve conflicts between scheduled recordings.

248. The system defined in claim 210 further configured to allow the system to resolve conflicts between scheduled recordings.

249. The system defined in claim 210 further configured to display scheduled recordings and scheduled reminders on a program guide screen.

250. The system defined in claim 249 further configured to display conflicts between recordings and reminders.

251. The system defined in claim 249 further configured not to display conflicts between recordings and reminders if the system supports simultaneous watch and record.

252. The system defined in claim 249 further configured to allow the user to resolve conflicts between recordings and reminders.

253. An interactive television program guide series reminder system for providing reminders of scheduled television programs to a plurality of users, comprising:

- means for implementing an interactive television program guide;

- means for receiving television program listings for the scheduled television programs;

- means for displaying the television program listings;

- means for selecting a given television program listing from the displayed television program listings;

- means for automatically determining with the interactive television program guide whether the selected program is part of a series; and

- means for displaying television program series reminders that remind the user when each episode of the series is to be broadcast.

254. An interactive television program guide series recording system for recording scheduled

television programs for a plurality of users,  
comprising:

means for implementing an interactive  
television program guide;

means for receiving television program  
listings for the scheduled television programs;

means for displaying the television  
program listings;

means for selecting a given television  
program listing from the displayed television program  
listings;

means for automatically determining with  
the interactive television program guide whether the  
selected program is part of a series; and

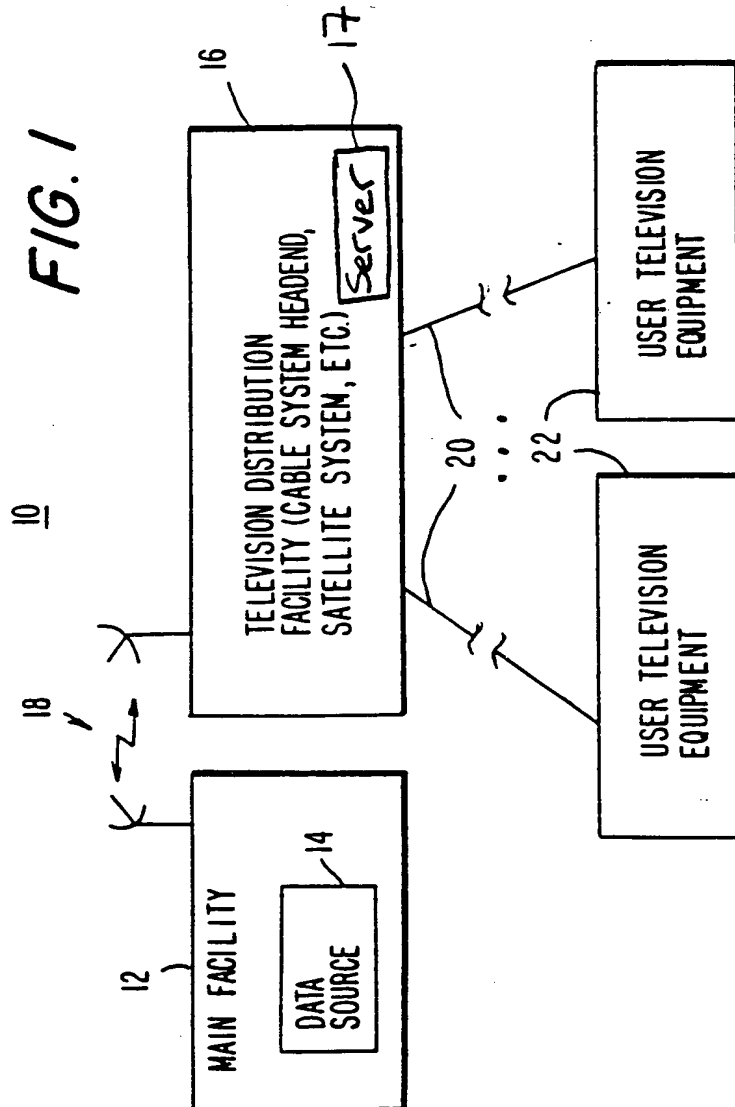
means for recording each television  
program in the series.

Abstract of the Disclosure

An interactive television program guide system with program series reminder and recording capabilities is provided. The system allows a user to  
5 set a reminder or schedule a recording for a single episode or for each episode of a program series. In addition, other options may be provided that allow the user to determine, for example, whether to schedule reminders/recordings for episodes on all channels on  
10 which the program airs or only on a selected channels, whether to schedule reminders/recordings for all episodes including reruns or only new episodes, whether to schedule reminders/recordings for network or syndicated episodes, and whether to schedule  
15 reminders/recordings for episodes on all days or only on selected days of the week. Before the scheduled broadcast time of each episode of each selected program series, the system sends a reminder message to the user that reminds the user of the program episode or sends a  
20 record command to a videocassette recorder to initiate recording of the episode. The system allows a user to view a list of all currently requested program reminders and scheduled program recordings. The user may update, change, or cancel any entry in either list  
25 or the system may automatically update the lists to

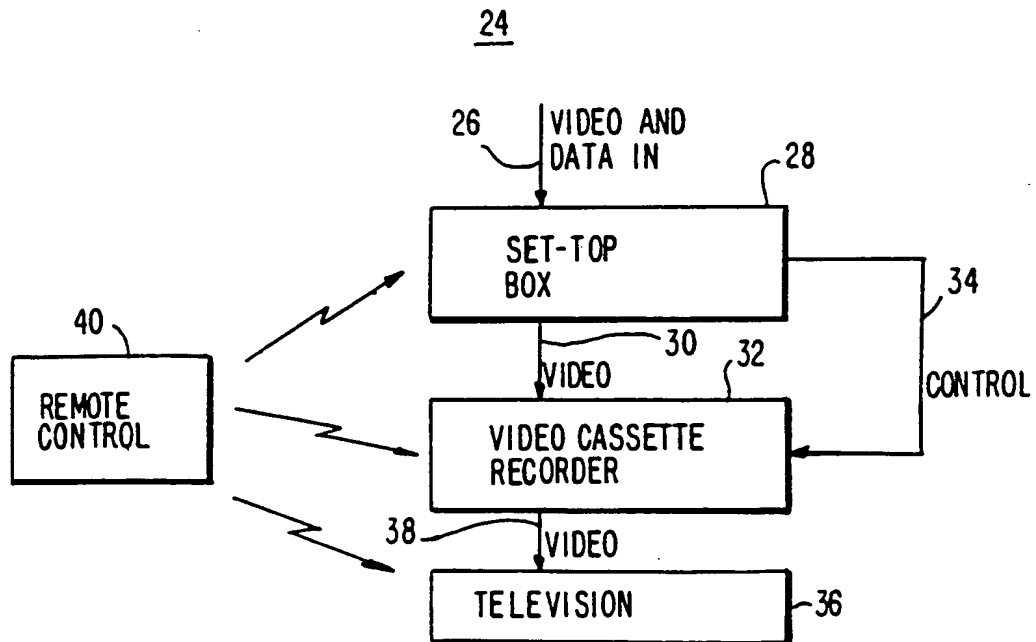
match new broadcast schedule information. If the user sets a reminder or schedules a recording that conflicts with an existing reminder or recording, the system may inform the user of the conflict and allow the user to  
5 resolve the conflict or the system may resolve the conflict.

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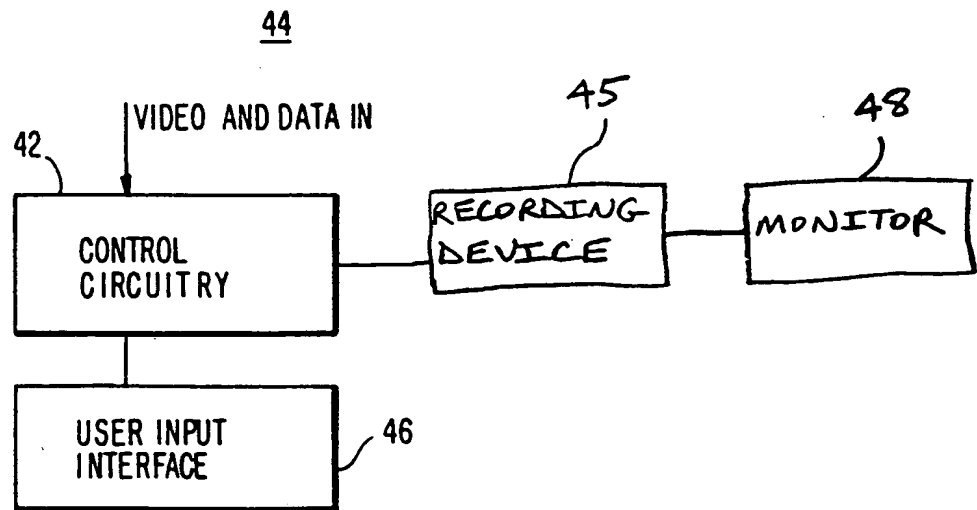
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FIG. 2





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**FIG. 3**

FIG. 4

50

	76	70	70	
77	6:35PM JULY 9, 1997	6:30PM	7:00PM	7:30PM
52	2 KJRH	PROGRAM 1		PROGRAM 2
54	3 HBO	PROGRAM 1	PROGRAM 2	
56	4 NBC	PROGRAM 1	SEINFELD	PROGRAM 3
58	5 FOX	PROGRAM 1	PROGRAM 2	PROGRAM 3
	68	74		

57

66

72

FIG. 5

50

6:35PM JULY 9, 1997		6:30PM	7:00PM	7:30PM
54 → 3 HBO	PROGRAM 1	PROGRAM 2		
56 → 4 NBC	PROGRAM 1	SEINFELD	PROGRAM 3	
58 → 5 FOX	PROGRAM 1	PROGRAM 2	PROGRAM 3	
55 → 7 ABC	PROGRAM 1	PROGRAM 2		

58

66

59

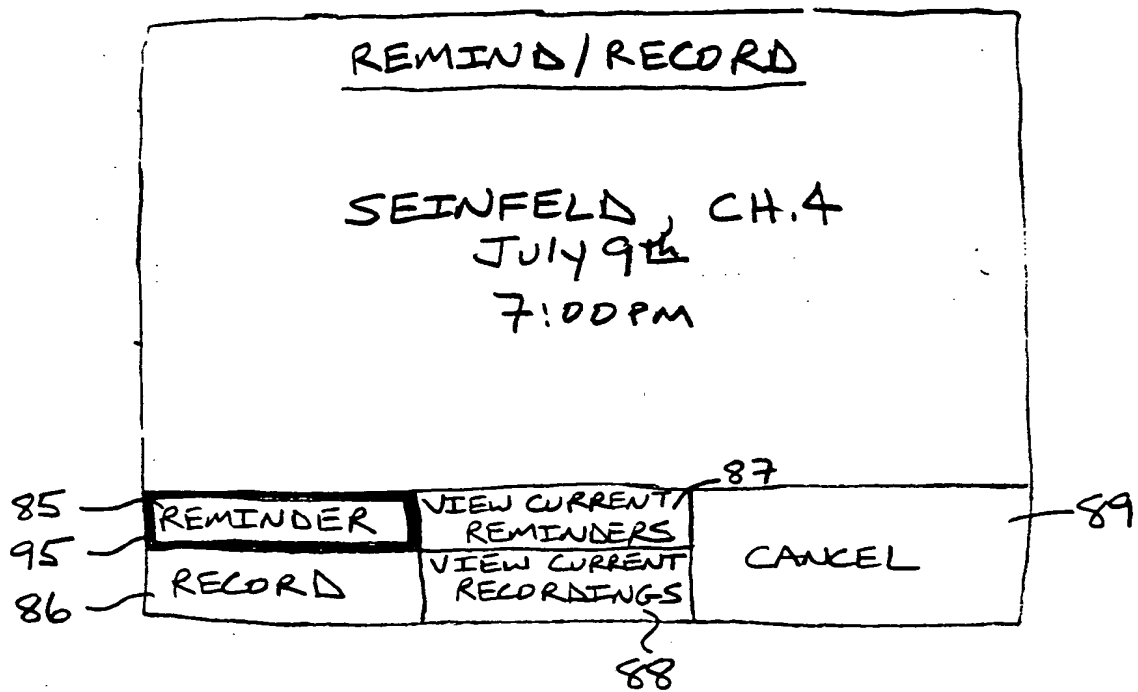
70

FIG. 6

90

91	SEINFELD (0:30), CH.4, 7:00PM		JUL 19, 1997
92	<div>REMINDER OPTIONS</div> <div> <div>Schedule Reminder For:</div> <div> <input type="radio"/> This episode           <input checked="" type="radio"/> Entire Series         </div> </div> <div> <div>Program channels:</div> <div> <input type="radio"/> This channel           <input type="radio"/> All channels         </div> </div>		
93	<div>How soon before event do you want to be reminded?</div> <div> <input type="radio"/> 3 Minutes (1-15)           <input type="radio"/> Other         </div>		
94	OK	CANCEL	<div>VIEW CURRENT REMINDERS</div>

97

96

104

107

108

98

FIG. 7

110

How Soon Before Event Do you want To Be Reminded?		
<input type="radio"/> 1 Hour	<input type="radio"/> Days : _____	
<input type="radio"/> 1 Day	<input type="radio"/> Hours : _____	
<input type="radio"/> 2 Days	<input type="radio"/> 15 Minutes : _____	
	117 	119 
	ENTER	EXIT

FIG. 8

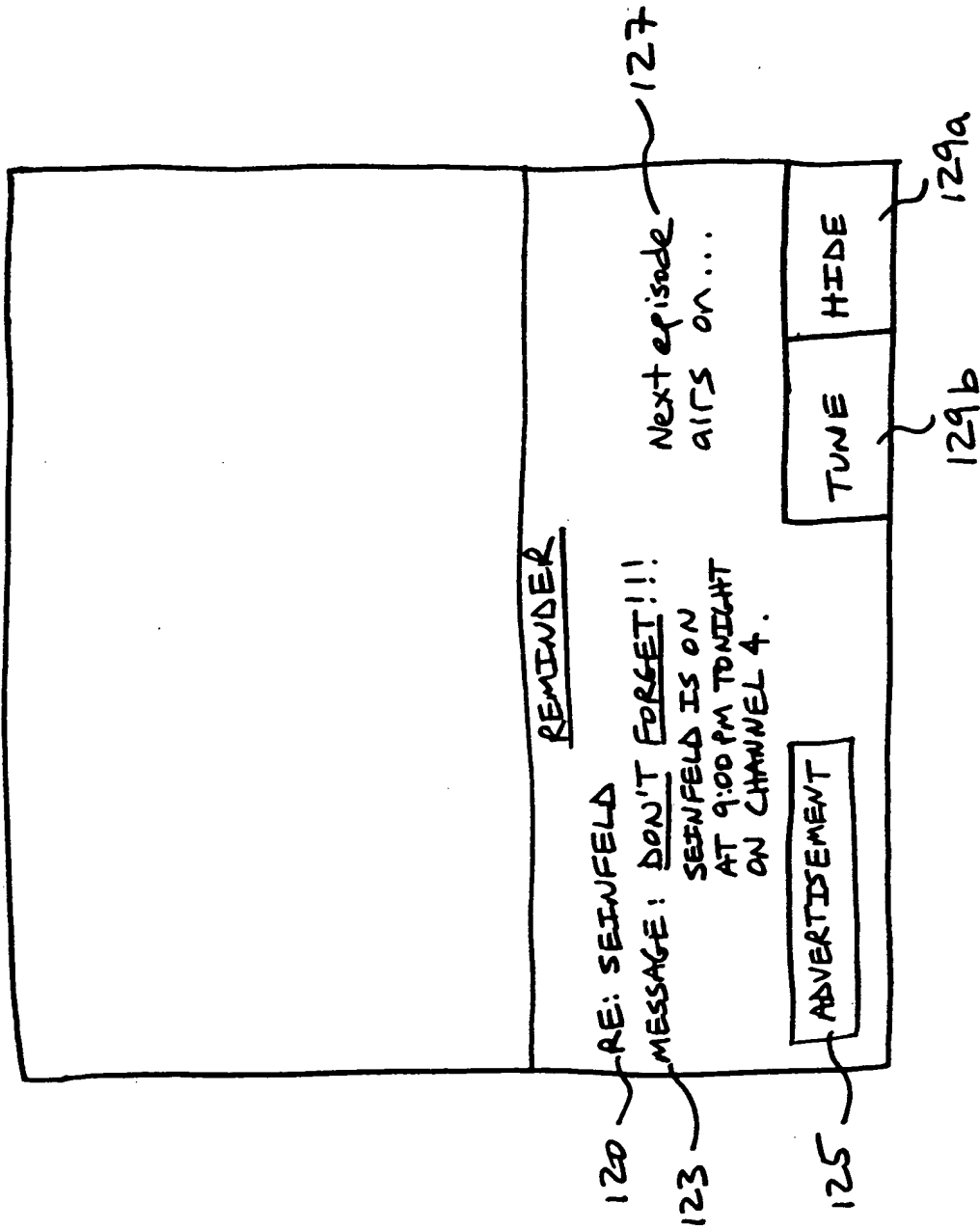


FIG. 9

130

CURRENT REMINDERS			
PROGRAM	EPISODES	REMINDER	SUBMITTED
135 SEINFELD	JULY 9, 1997 CH. 4, 7:00PM	1 HOUR BEFORE; RERUN	JULY 5, 1997 AT 3:04PM
131 THIS WEEK WITH SAM & COPIE	SERIES: SUNDAY, JULY 10 10:30AM, CH. 7	1 DAY BEFORE; NEW (first-run)	JULY 8, 1997 AT 5:09PM
SEINFELD	JULY 14, 1997 CH. 11, 11:00PM	1 HOUR BEFORE; RERUN	JULY 9, 1997 AT 5:03PM
134 THIS WEEK WITH SAM & COPIE	133 SERIES: SUNDAY JULY 17 10:30AM, CH. 7 JULY 24	1 DAY BEFORE; NEW (first-run)	JULY 8, 1997 AT 5:09 PM
132 →		138	139
137 VIEW CURRENT RECORDINGS	CANCEL	EXIT	

FIG. 10



135

SEINFELD (0:30), CH. 4, 7:00 PM		JULY 9, 1997	
UPDATE REMINDER			
Update Reminder For: <input type="radio"/> This episode <input checked="" type="radio"/> Entire Series		Program Channels: <input type="radio"/> This channel <input type="radio"/> Selected channels <input type="radio"/> All channels	
How soon before event do you want to be reminded? <input type="radio"/> Minutes (1-15) <input type="radio"/> Other		Program Days: <input type="radio"/> This day <input type="radio"/> Selected days <input type="radio"/> All days	
<input type="radio"/> Minutes (1-15) <input type="radio"/> Other		Program Type: <input type="radio"/> First-run <input type="radio"/> Rerun <input type="radio"/> All network <input type="radio"/> Syndicated <input type="radio"/> Unviewed only	
OK	CANCEL SERIES REMINDER	CANCEL CURRENT EPISODE REMINDER	EXIT
124		112	
121		111	

FIG. 10a

140

SEINFELD (0:30), CH. 4, 7:00 PM		JUL 19, 1997	
RECORDING OPTIONS			
Schedule Recording For:		Program channels	
<input type="radio"/> This episode <input checked="" type="radio"/> Entire Series		<input type="radio"/> This Channel <input type="radio"/> All Channels	
		Program days:	
		<input type="radio"/> This day <input type="radio"/> All days	
		Program type:	
		<input type="radio"/> First-run program <input type="radio"/> Network syndicated <input type="radio"/> Out of network only	
OK	CANCEL	REMEMBER	VIEW CURRENT RECORDINGS

FIG. 11

170

CURRENT RECORDINGS			
PROGRAM	EPISODES	SUBMITTED	
SEINFELD	JULY 9, 1997 CH 4, 7:00 PM (RE RUN)	JULY 5, 1997 at 3:04 PM	
THIS WEEK WITH SAM + COCKIE	ENTIRE SERIES: SUNDAYS, CH. 7 10:30 AM (First-run) JULY 10 JULY 17	JULY 8, 1997 at 5:09 PM	
	178		
VIEW CURRENT REMINDERS	CANCEL	EXIT	
177		179	

FIG. 12

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175

SEINFELD(0:30) CH.4, 7:00PM		JULY 9, 1997	
<u>UPDATE RECORDING</u>			
<u>Program channels:</u> <input type="radio"/> This channel <input type="radio"/> selected channels <input type="radio"/> All channels			
<u>Program Days:</u> <input type="radio"/> This day <input type="radio"/> selected days <input type="radio"/> All days			
<u>Program Type:</u> <input type="radio"/> First-run <input type="radio"/> Rerun <input type="radio"/> All <input type="radio"/> Network <input type="radio"/> Syndicated <input type="radio"/> Unrecorded only			
OK	CANCEL SERIES Recording	CANCEL CURRENT EPISODE Recording	EXIT

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174

175

176

FIG. 12a

180

181 CURRENT REMINDERS			
PROGRAM	EPISODES	REMINDER	SUBMITTED
X	MAY 3, 1997 Monday CH. 4, 8:00pm	1 hour before RE RUN	MAY 1, 1997 at 1:30pm
Y	SERIES: Mondays CH. 7, 8:00pm MAY 3, 1997	.	.
Z	MAY 9, 1997 CH. 11, 9:00pm	.	.
Y	SERIES: MAY 10, 1997 MAY 17, 1997	.	.
VIEW CURRENT RECORDINGS			
		CANCEL	EXIT

CONFLICT 183

CONFLICT

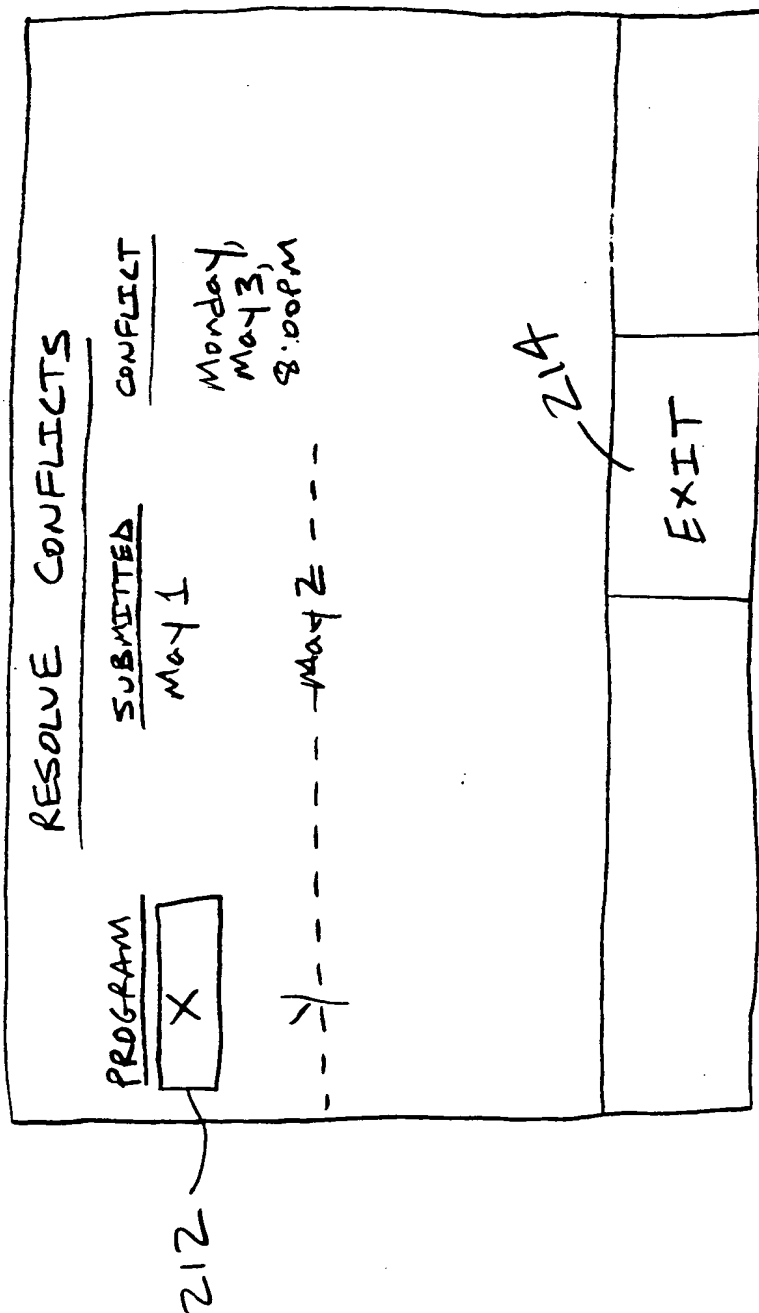
FIG. 13

190

CURRENT RECORDINGS			
PROGRAM	EPISODES	SUBMITTED	
X	May 3, 1997 Monday CH. 4, 8:00pm	May 1, 1997 at 1:30pm	CONFLICT
Y	SERIES: Mondays CH. 7, 8:00pm May 3, 1997	May 2, 1997 at 5:00pm	CONFLICT
Z	May 9, 1997 CH. 11, 9:00pm	:	
Y	SERIES: May 10, 1997 May 17, 1997		
↓			Resolve Conflicts

FIG. 14

210



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FIG. 15

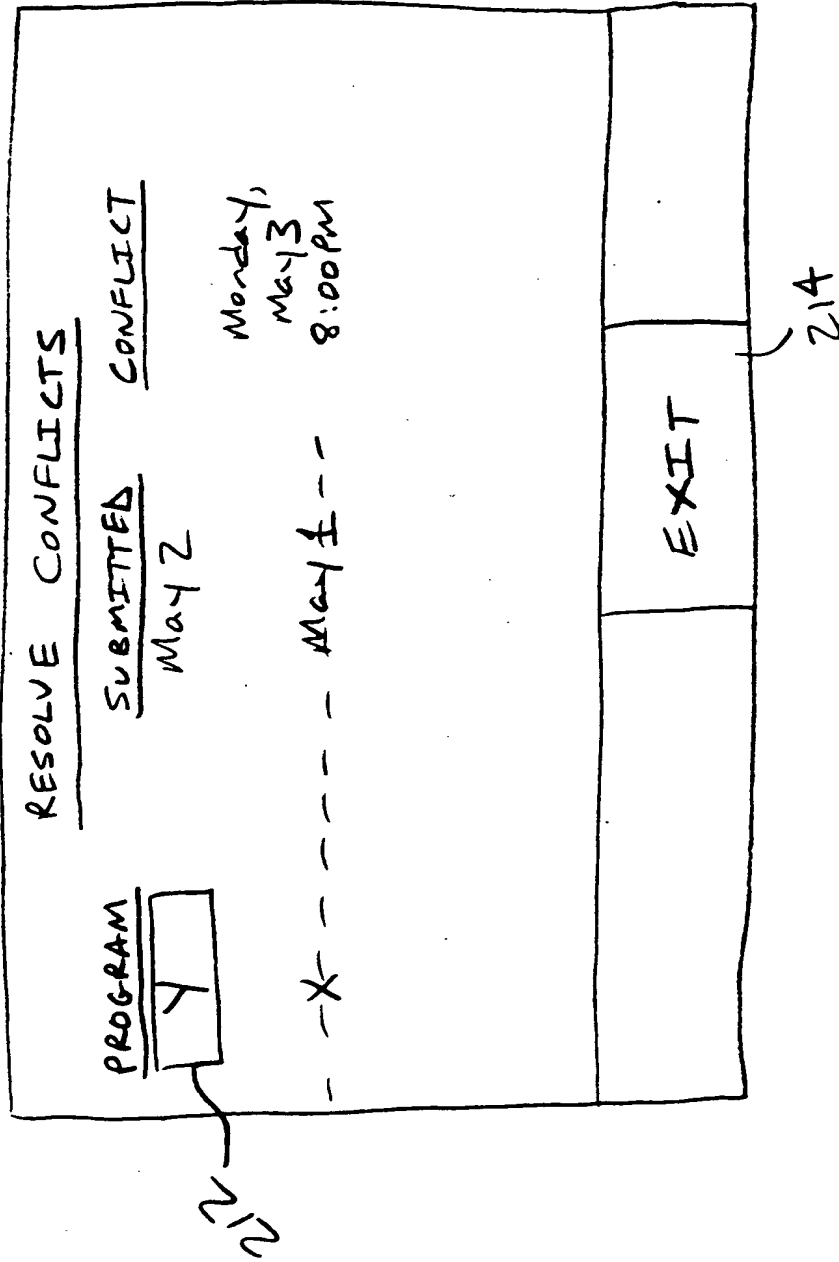


FIG. 16



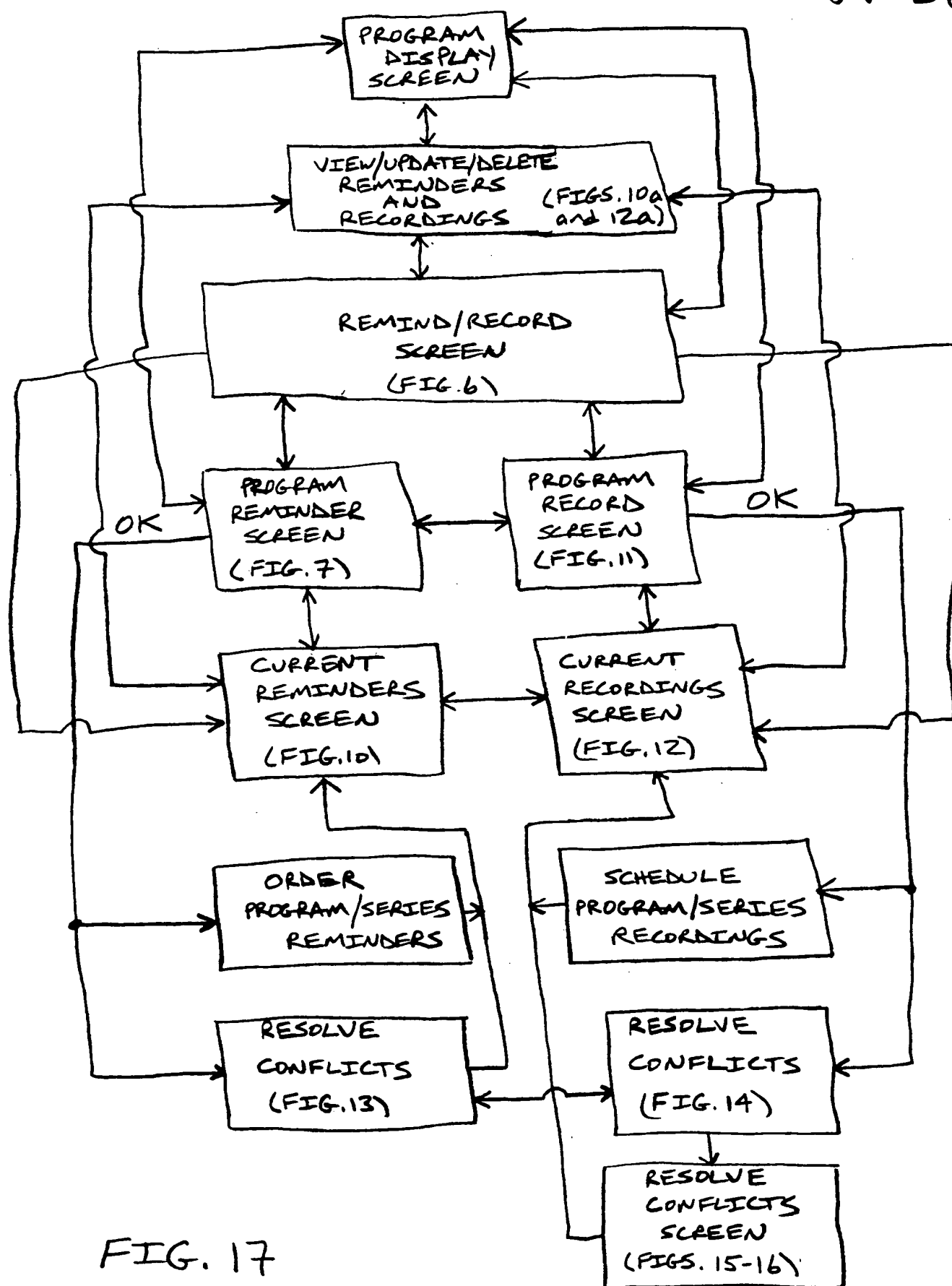


FIG. 17

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am an original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SERIES REMINDERS AND SERIES RECORDING FROM  
AN INTERACTIVE TELEVISION PROGRAM GUIDE

the specification of which

☒ is attached hereto

☐ was filed on \_\_\_\_\_ as  
Application Serial No. \_\_\_\_\_.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims.

I do not know and do not believe that the invention was ever patented or described in any printed publication in any country before my or our invention thereof or more than one year prior to this application.

I do not know and do not believe that the invention was in public use or on sale in the United States of America more than one year prior to this application.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known by me to be material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having

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ELECTRONIC PROGRAM GUIDE  
WITH ADVANCE NOTIFICATION

Cross Reference to Related Application

This application claims the benefit of  
5 United States Provisional Application No. 60/097,504,  
filed August 21, 1998.

Background of the Invention

This invention relates to program guide  
systems, and more particularly, to techniques for  
10 notifying a user of television programs.

Cable, satellite, and broadcast television  
systems provide viewers with a large number of  
television channels. Viewers have traditionally  
consulted printed television program listings to  
15 determine which programs were scheduled to be broadcast  
on a particular day and at a particular time.

Recent technological advances have allowed  
more convenient and advanced program guide services to  
be developed. For example, passive television-based  
20 program guides have been developed that allow  
television viewers to view television program listings  
directly on their television sets. In addition,

interactive television program guide services have been developed that allow a service provider to deliver television program listings data to a user's local set-top box. An interactive television program guide application in the set-top box allows the user to display television program listings on the user's television set. In known interactive program guide systems, the program listings data made available to a user are limited to a predetermined time frame of program listings.

Users may be interested in programs other than the programs in the available time frame of program listings. Such so-called non-frame television programs are those television programs which are outside the current display time frame. In contrast, in-frame television programs are those television programs which are inside the current display time frame. The current display frame for program guides is typically about two weeks or less, which is limited by the size of the program guide database that is maintained by the program guide. The frame can also be limited by the bandwidth for the distribution of the data and limited by the ability to collect accurate data (e.g., collected listings which are farther out in time can be less accurate). As an example of the category of non-frame television programs, consider movies presently showing in movie theaters but soon to be released on pay-per-view cable. Because cable customers are not provided with information that lets them know that the movie they are planing to see at the local movie theater will be available shortly on cable, cable companies stand to lose revenue to movie theaters. Similar problems exist for televised sporting events and the like.

Thus, users are still faced with the problem of tracking television programs that they desire to watch but which have not yet been scheduled (i.e., non-frame television programs).

5           It is therefore an object of the present invention to provide a way to notify users of upcoming television programs.

#### Summary of the Invention

10           This and other objects of the invention are accomplished in accordance with the principles of the present invention by providing program guide notification methods and systems.

          Users may be interested in programs which are not in a current program listings time frame of a  
15   program guide. For such programs, the program guide can provide a notification option. The notification option can provide the user with an opportunity to request that a notification to be received when a program of interest is determined to be in the current  
20   time frame. Notifications can be message notifications, reminder notifications, e-mail notifications, etc. The user can be provided with the opportunity to setup the parameters for notifications. The program guide can provide the user with the  
25   opportunity to view a list of notifications. Notifications can be set by selecting an advertisement for an upcoming program that is not presently in the current time frame, by entering a title of a program, by selecting a program from a coming soon display  
30   screen, etc. A notification can include information on the program for which the notification is being provided and can include user-selectable options. The program guide can monitor the user's notification

requests to collect information that can be used in marketing, scheduling programs, advertising, etc.

According to one aspect of this invention, a method of providing interactive options for non-frame television programs on a display screen of a system (e.g., a television program guide system) is provided. The method includes: (1) presenting on the screen (e.g., a program guide screen) at least one option that corresponds to a non-frame television program,  
10 (2) allowing the user to select a first option, and  
(3) providing the user a service associated with the first option.

In another embodiment, an interactive method of notifying a user of non-frame television programs that are now in-frame for use with a system (e.g., a television program guide system) is provided. This method includes: (1) receiving non-frame data that corresponds to at least one non-frame television program, and (2) when the non-frame program is in-  
20 frame, notifying a user that the program will be broadcast in the current time-frame by providing the user with at least one interactive option that corresponds to the data.

In yet another embodiment according to this invention, a method for providing notifications of non-frame television programs to a user using a system (e.g., a television program guide system) is provided. The method includes: (1) allowing a user to specify a non-frame television program outside of the current  
30 display time frame, and (2) notifying the broadcast time to the user when the non-frame television program is now in the current time frame. In this embodiment, notification can be either non-interactive or interactive. In one non-interactive example, the

method can involve sending a notification (or providing a notification order screen) with information regarding one or more selected non-frame television programs that are to be aired without a user-selectable option. In  
5 contrast, an interactive example might include a user-selectable option.

A coming soon program display screen can be provided according to this invention. Included on the coming soon program display screen are non-frame  
10 television programs which are outside the current display time frame.

If a user selects a program or a pay-per-view event that has not yet been included in the program listings of the current time frame, additional  
15 information related to the program or event can be displayed in a program information box. In addition to viewing this additional information on the program selected, the user can order a notification to notify the user when the selected program will be broadcast.  
20 Options can also be provided that allow the user to determine when notifications will be generated.

If desired, a notification can be set by directly entering the title of a television program for which notifications are desired.

25 As mentioned above, the user can also view a list of all currently requested notifications. If desired, information, such as the program name, type of notification, and the date and time the request was submitted can be displayed on the list for each  
30 notification. Entries can be added to the current notification list as soon as the user submits a new request. In addition, the user can cancel notification entries.

In yet a further aspect of the invention, electronic mail notifications can be set and generated based on other preferences which the user can specify.

Further features of the invention (including  
5 systems for implementing these methods), its nature and various advantages will be more apparent from the accompanying drawings and the following detailed descriptions of the preferred embodiments.

#### Brief Description of the Drawings

10 FIG. 1 is a diagram of an illustrative television program guide system in accordance with the present invention.

FIG. 2 is a diagram of an illustrative main  
15 program guide menu display screen in accordance with the present invention.

FIG. 3 is a diagram of an illustrative current listings display screen from which the program listings in the current time frame can be available in accordance with the present invention.

20 FIG. 4 is a diagram of an illustrative notifications display screen which can provide an illustrative notifications list in accordance with the present invention.

FIG. 5 is a diagram of an illustrative  
25 messages display screen which can include a list of messages in accordance with the present invention.

FIG. 6 is a diagram of an illustrative message display screen in accordance with the present invention.

30 FIG. 7 is a diagram of an illustrative notification display screen in accordance with the present invention.



FIG. 8 is a diagram of an illustrative reminder display screen in accordance with the present invention.

5 FIG. 9 is a diagram of an illustrative set message display screen in accordance with the present invention.

FIG. 10 is a diagram of an illustrative e-mail display screen in accordance with the present invention.

10 FIG. 11 is a diagram of an illustrative new notification display screen in accordance with the present invention.

15 FIG. 12 is a diagram of an illustrative reminder list display screen in accordance with the present invention.

FIG. 13 is a diagram of an illustrative coming soon display screen in accordance with the present invention.

20 FIG. 14 is a diagram of an illustrative coming soon display screen in accordance with the present invention.

FIG. 15 is a diagram of an illustrative setup display screen in accordance with the present invention.

25 FIG. 16 is a diagram of an illustrative notification setup display screen in accordance with the present invention.

30 FIG. 17 is a flow chart of illustrative steps involved in providing a notification feature in accordance with the present invention.

FIG. 18A is a diagram of an illustrative program guide screen containing television program guide listings in accordance with the present invention.

FIG. 18B is a diagram of an illustrative coming soon program screen in accordance with the present invention.

FIG. 19 is a diagram of an illustrative notification screen that allows a user to enter information for ordering notifications in accordance with the present invention.

FIG. 20 is a diagram of an illustrative notification screen that allows the user to enter more specific information for ordering notifications in accordance with the present invention.

FIG. 21 is a diagram of an illustrative notification in accordance with the present invention.

FIG. 22 is a diagram of an illustrative notification screen listing all current notification orders in accordance with the present invention.

FIG. 23 is a diagram of an illustrative notification screen that allows a user to enter a program title and to select among various options when ordering a notification in accordance with the present invention.

#### Detailed Description of the Preferred Embodiments

An illustrative interactive television program guide system 10 in accordance with the present invention is shown in FIG. 1. Main facility 12 can contain a back office processor 14 for organizing data, such as television program guide listings data, as will be described in greater detail below. Main facility 12 can also contain a program guide database 16 for storing program guide information, pay-per-view ordering information, television program promotional information, etc. Some of the information stored in database 16 can be from an external data source 18.

Back office processor 14 is used to process the information stored in database 16.

Information from database 16 can be transmitted to multiple television distribution facilities, such as television distribution facility 20 via communications links, such as communications link 21. Only one television distribution facility is shown in FIG. 1 to avoid over-complicating the drawings. Each Link 21 can be a satellite link, a telephone network link, a cable or fiber optic link, a microwave link, a combination of such links, or any other suitable communications path. If it is desired to transmit video signals over link 21 in addition to data signals, a relatively high bandwidth link, such as a satellite link is generally preferable to a relatively low bandwidth link, such as a telephone line.

Television distribution facility 20 is a facility for distributing television signals to users. Television distribution facility 20 can be, for example, a cable system headend, a broadcast distribution facility, a satellite television distribution facility, or any other suitable distribution facility.

The program guide information transmitted by main facility 12 to television distribution facility 20 includes television program listings data for current and future television programs. The television program listings data for each program preferably includes numerous program characteristics, e.g., the title of the program, the channel for the program, a scheduled broadcast time (start time) and an ending time (or duration). Other typical program characteristics include ratings, critics ratings, descriptions,

categories (sports, movies, comedy, children, etc.), actors, etc. Transmitted program information can also include advertising information and pay program data, such as pricing information for individual programs and  
5 subscription channels, time windows for ordering programs and channels, telephone numbers for placing orders that cannot be impulse ordered, etc.

Television distribution facility 20 distributes television programming and program guide  
10 information to the user television equipment 26 or the user personal computer (PC) equipment 28 of multiple users via communications paths 30 and 32, respectively. PC equipment 28 is based on a central processing unit (CPU) 44 and can have a monitor 46 and keyboard 48.  
15 User television equipment 26 is based on a set-top box 34 and can have optional videocassette recorder 38, television 40, and remote control 42.

Various techniques can be used to distribute television programming and program guide information.  
20 For example, television programming can be distributed over analog television channels and program guide data can be distributed over an out-of-band channel on paths 30. Data distribution can also involve using one or more digital channels on paths 30 and 32. Such  
25 digital channels can also be used for distributing television programming and other information. Multiple television and audio channels (analog, digital, or both analog and digital) can be provided to set-top boxes 34 and PC equipment 28 via communications paths 30 and 32.  
30 In user television equipment 26, television programs can be tuned to by user's set-top box 34 and can be displayed by television 40. In user PC equipment 28, a video board or other such component can be used to tune to a television program, and the television program can

be displayed on monitor 46. Program listings and other information can be distributed via communications paths 32 to PC equipment 28, which can have a cable modem or other such communications device for receiving or transmitting data. In addition, program listings and other data can be distributed by one or more distribution facilities that are similar to but separate from television distribution facility 20 using communications paths that are separate from communications paths 30 and 32. If desired, data from the main facility 12 can be distributed to PC equipment 28 over the Internet or other suitable communications path that does not involve the use of television distribution facility 20. In some configurations, program guide functions are provided in the form of an on-line program guide by using PC equipment 28 to access a web server, such as web server 29 over the Internet 31 or other such data network.

The program guide system can use a client-server architecture whether or not the system involves use of the Internet. In a client-server arrangement, the program guide is partially implemented on a server and partially implemented on a client. The server can be a server, such as server 22 located at, for example, television distribution facility 20. Processors in the user equipment, such as set-top box 34 or CPU 44, can act as the client processors. Program guide data that are distributed to a client-server program guide at television distribution facility 20 can be stored in a database 24 at television distribution facility 20 that is maintained by server 22. For clarity, the present invention is described primarily in the context of an interactive television program guide that is

implemented on user equipment using a set-top box 34 or CPU 44 that receives data from television distribution facility 20, rather than in the context of program guides that are implemented using an on-line program  
5 guide configuration, are implemented partially on a server and partially on user equipment, or are implemented using any other such arrangements.

Certain functions, such as pay program purchasing can require set-top boxes 34 to transmit  
10 data to television distribution facility 20 over communications paths 30. If desired, such data can be transmitted over telephone lines or other separate communications paths. If functions, such as these are provided using facilities separate from television  
15 distribution facility 20, some of the communications involving set-top boxes 34 can be made directly with the separate facilities.

User television equipment 26 has a receiver, which is typically a set-top box, such as set-top  
20 box 34, but which can be other suitable television equipment into which circuitry similar to set-top box circuitry has been integrated. For example, user television equipment 26 can be based on an advanced television receiver, such as a high definition  
25 television ("HDTV") receiver. Program guide data can be distributed to set-top boxes 34 periodically or continuously and stored in database 36. In a client-server architecture, this database need not be maintained on the set-top box and may be distributed  
30 over a number of different locations. For example, the program guide can maintain a database, such as database 24, using a server, such as server 22 located at television distribution facility 20 or at some other appropriate location or locations. Television

distribution facility 20 can poll set-top boxes 34 periodically for certain information (e.g., pay program account information or information regarding programs that have been purchased and viewed using locally-generated authorization techniques).

Main facility 12 preferably contains a processor to handle information distribution tasks. Each set-top box 34 preferably contains a processor to handle tasks associated with implementing a program guide application on the set-top box 34. User PC equipment contains CPU 44 to handle tasks associated with implementing a program guide application. Television distribution facility 20 can contain a processor for tasks associated with monitoring a user's interactions with the interactive program guides implemented on user PC equipment 28 and user television equipment 26 and for handling tasks associated with the distribution of program guide data and other information to user PC equipment and user television equipment 26. Moreover, the processor of television distribution facility 20 can be used to support the server functions of a client-server program guide.

In user television equipment 26, videocassette recorders 38 or other suitable recording devices allow selected television programs to be recorded. Each videocassette recorder 38 is connected to a respective television 40. To record a program, set-top box 34 tunes to a particular channel and sends control signals to videocassette recorder 38 (e.g., using an infrared transmitter) that direct videocassette recorder 38 to start and stop recording at the appropriate times.

During use of the interactive television program guide implemented on set-top box 34, television

program listings and other information can be displayed on television 40. Such program guide displays can be presented as an overlay on top of a television program to which the user has tuned with set-top box 34 or can  
5 be presented in place of such a program. Each set-top box 34, videocassette recorder 38, and television 40 can be controlled by one or more remote controls 42 or any other suitable user input interface, such as a  
10 wireless keyboard, mouse, trackball, dedicated set of buttons, touch screen display remote, etc. Remote controls, such as remote control 42, have various buttons that can be pressed by the user such as arrow keys (for directing on-screen movement of a highlight region, scrolling functions, etc.), an OK, select,  
15 enter, or other such selection key for making a selection (hereinafter referred to as an OK key), channel number keys (for selecting a television channel), a favorites key (to invoke functions related to user preferences), a delete key (to delete menu  
20 items or to express a disinterest in certain user preferences), etc.

PC equipment, such as PC equipment 28, is based on a CPU 44 that maintains a database 45. A program guide implemented on PC equipment 28 can be  
25 used to access and display program guide information on monitor 46. User selections and inputs can be made by a keyboard 48, mouse, trackball, or other PC input devices. It is understood that the following discussion, although directed to user television  
30 equipment and set-top boxes, is applicable to program guides used in connection with PC equipment.

Notification can be presented in a number of ways, such as "on-screen," "on-line," etc. As used herein, "on-line" notification includes notifications



transmitted, at least in part, using the Internet.  
"On-screen" notification includes notifications  
transmitted to user-television equipment. "On-screen"  
and "on-line" notification methods are not mutually  
5 exclusive. For example, a notification can take the  
form of an electronic mail message "e-mail" that was  
transmitted via the Internet and displayed on user  
television equipment.

A program guide display screen can include a  
10 notifications option. For example, as shown in FIG. 2,  
illustrative main program guide menu display screen 60  
can include notifications option 62 and six other  
options (current listings option 64, movies option 66,  
Pay-per-view option 68, messages option 70, coming soon  
15 option 72, and setup option 74). In addition, display  
screen 60 can include brand logo 82, system operator  
logo 84, current-time display portion 86, new message  
indicator 88, and advertisements 76, 78, and 80.

Brand logo 82 can identify the brand of the  
20 interactive program guide (e.g., TV Guide). System  
operator logo 84 can identify the brand of the system  
operator. Current-time display portion 86 can contain  
the current time of day. New message indicator 88 can  
indicate that there are messages available.

25 A program guide user can select an option by,  
for example, navigating a highlight region on a  
selectable option and pressing a data entry key, such  
as an OK key of a remote control.

A notification option can be available for  
30 programs that are not in the current program listings  
time frame of the program guide. Such out-of-time-  
frame programs (i.e., non-frame programs) can include  
programs that are not in the current time frame of the  
program guide, but are in a schedule stored at a main

facility. Such non-frame programs can further include  
unscheduled programs that have related information at  
the main facility indicating that they are coming soon  
(e.g., movies in current cinematic release, new series  
5 that have been announced but not yet scheduled,  
returning series which have not yet been scheduled,  
special events, etc.). Such non-frame programs can  
further include programs that the user can know of but  
for which the main facility has no available  
10 information.

The program guide system can store a list of  
programs which are not in the current time frame but  
have been scheduled or which are upcoming programs  
that have not yet been scheduled. The list can be  
15 stored at a main facility, at a server at a television  
distribution facility, or at user television equipment.  
When a user is provided with the opportunity to enter a  
title for a program (see below), the list can be  
searched for programs matching the entered title. The  
20 search can occur at the location where the list is  
stored. As programs move into the current program  
guide time frame, the comparison between the database  
programs in the current program guide time frame and  
programs in the user's notifications list can take  
25 place at any of those locations (e.g., main facility,  
server, or user television equipment).

For programs that are already in the current  
time frame of a program guide, a notification can not  
be available, although a reminder option can be  
30 available.

When a user selects current listings  
option 64, the program guide can display a current  
listings display screen, such as illustrative current  
listings display screen 96 of FIG. 3. From the current

listings display screen 96, the program guide can provide the user with the opportunity to view a time versus channel listing of programs. The display 96 can provide the user with the opportunity to view and act  
5 on the program listings for the current time frame (e.g., one week, two weeks, etc.). The program guide can retrieve the program listings for the current time frame from a local database (e.g., database 24 or 36 of FIG. 1).

10 When a user selects movies option 66 or pay-per-view option 68, the program guide can display a listings display screens for the current time window of movies or pay-per-view programs. Each listings display screens can have a format which is similar to  
15 illustrative current listings display screen 96. It is to be understood that the format for display screen 96 is illustrative and other formats for listings display screens can be employed.

When a user selects a notification option,  
20 such as notifications option 62 of FIG. 2, the program guide can display illustrative notifications display screen 90 of FIG. 4. Display screen 90 can include list 92 of notifications that the user has previously set (e.g., notifications for the Blair Witch Project,  
25 Now and Again, and the Mummy). The program guide can provide the user with the opportunity to select any one of the displayed notifications in order to delete or modify the selected notification. An add new notification option, such as option 94, can provide the  
30 user with the opportunity to add a new notification to the list. The add new notification option can be contained in list 92 or can be in another suitable position on display screen 90.

When a user selects a messages option, such as messages option 70 of FIG. 2, the program guide can display a messages display screen, such as illustrative messages display screen 98 of FIG. 5. Display  
5 screen 98 can include a list of messages 100. The list 100 can include all messages that have been sent to this user's household. List 100 can include notification messages (e.g., the first two messages in list 100). Other types of messages can be included in  
10 list 100, such as a message for informing the user of a cable outage. A user can select a message from list 100 by navigating a highlight region on an item in the list and pressing a data entry key, such as an OK key of a remote control.

15 When a user selects a message from list 100, the program guide can display a message display screen, such as message display screen 102 of FIG. 6. When the selected message is a message other than a notification message, the program guide can display the message  
20 title, message text, and the option to keep or delete the selected message. When the selected message is a notification message, the program guide can display the program title as the message title and the program description as the message text. For a notification  
25 message, the program guide can display the scheduled time and channel for the program. The program guide can also display options which are related to the program. For example, the program guide can display order option 104, keep option 106, delete option 108,  
30 air times option 110, and reminder option 112. When the notification message is for a pay-per-view program, order option 104 can be displayed to provide the user with the opportunity to impulse order the program. When reminder option 112 is selected, the program guide

can provide the user with the opportunity to set a reminder for the program. When air times option 110 is selected, the program guide can provide the user with the opportunity to view a list of broadcast times.

5 When keep option 106 is selected, the program guide can keep the message for future reference by the user, and when delete option 104 is selected, the program guide can delete the message. The program guide can determine which options can be displayed based on the  
10 program for which the notification message was received. For example, when the selected program is a pay-per-view program, order option 108 can be displayed. Air times option 110 can be displayed when there is more than one show time for the program.

15 A message can have been sent to users to announce to users that a program is coming soon (e.g., an e-mail advertisement for a future program which is not in the current time frame). For such messages, the program guide can display notify option 114. The time  
20 and channel of the program can not be displayed in the message since the program is not yet listed in the current time frame of the program guide. When the notify option 114 is selected for a program that is not currently listed, the program guide can provide the  
25 user with the opportunity to set a notification for that program.

For example, as shown in FIG. 7, when the user selects a notify option for a program that is not within the current time-frame of the program guide, the  
30 program guide can display a notification display screen, such as illustrative notification display screen 116 of FIG. 7. A notification display screen, such as illustrative notification display screen 116, can be displayed under certain other circumstances.

For example, when a user selects an advertisement for a program that is not listed in the current time frame, the program guide can display notification display screen 116. Also, when a user selects a program from a coming soon display screen (discussed below), the program guide can display notification display screen 116. Moreover, when a user selects a program from a notifications display screen (e.g., notifications display screen 90 of FIG. 4), the program guide can display notification display screen 116 to provide the user with the opportunity to modify or delete that notification.

Notification display screen 116 can include the title of the program and a description of the program. When a user has set a notification by entering a title of a program (discussed below) and a description is not yet available for that program, the program guide can simply display a description that is blank. Notification display screen 116 can include user-selectable options. For example, notification display screen 116 can include delete option 118, remind option 120, message option 122, and e-mail option 124.

When delete option 118 is selected, the program guide can delete the notification. The types of notification desired can be specified with user-selectable options, such as remind option 120, message option 122, and e-mail option 124. The program guide can display a status indicator (e.g., a checkmark) in remind, message, and e-mail options 120, 122, and 124 to indicate that the user has already selected a notification of this type for the program.

When a user selects a remind option, such as remind option 120 of FIG. 7, the program guide can

display a reminder display screen, such as reminder display screen 126 of FIG. 8. Display screen 126 can provide the user with the opportunity to confirm the setting of a reminder for the upcoming program. When a  
5 remind option is selected for a program that a reminder notification has already been set, the program guide can provide the user with an opportunity to delete the reminder.

When a user selects a message option, such as  
10 message option 122 of FIG. 7, the program guide can display a set message display screen, such as set message display screen 128 of FIG. 9. Display screen 128 can provide the user with the opportunity to confirm that a message should be sent to the user's  
15 household when the program is scheduled (e.g., when the upcoming program is now determined to be scheduled to be displayed during the current time frame). When the message option (e.g., message option 122 of FIG. 7) is selected for a program for which the message option has  
20 already been set, the program guide can query the user to determine whether the message should be canceled.

When a user selects an e-mail option, such as e-mail option 124 of FIG. 7, the program guide can display an e-mail display screen, such as e-mail  
25 display screen 130 of FIG. 10. E-mail display screen 130 can provide the user with the opportunity to select to have an e-mail notification sent to the user's e-mail address. E-mail display screen 130 can provide the user with the opportunity to enter an email  
30 address. Depending on the program guide system arrangement, an e-mail address can be entered with a remote control, a keyboard, a display remote, etc. If desired, a setup display screen, discussed below, can provide the user with the opportunity to enter an e-

mail address which would then be applied to all e-mail notifications. When an e-mail option (e.g., e-mail option 124 of FIG. 7) is selected and the user had already set an e-mail option earlier to receive an e-mail notification, the program guide can provide the user with the opportunity to delete the e-mail notification.

As discussed above, when a user selects an advertisement for a non-frame program, the program guide can display a notification display screen, such as notification display screen 116 of FIG. 7. For example, a user can select interactive advertisements 76, 78, and 80 of FIG. 2, which are for programs that are not yet available in the current time frame of the program guide. As shown in FIG. 2, advertisement 76 can be for the Blair Witch Project, which is a future program that is coming to pay per view. Advertisement 78, an advertisement for Now and Again, can be for a new program to air in the fall television season which is now being advertised in the summer season. Advertisement 80 can be an advertisement for the upcoming new season of the E.R. television program which can commence in the next time frame. When a user selects any one of the three advertisements 76, 78, and 80, the program guide can display a notification display screen, such as notification display screen 116 of FIG. 7.

When a user selects an add-new-notification option, such as add-new-notification option 94 of FIG. 4, the program guide can display a new notification display screen, such as new notification display screen 132 of FIG. 11. Display screen 132 can provide the user with the opportunity to enter the title of a program for which the user desires to



receive a notification. The title can be entered with a remote control, keyboard, a display remote, or another suitable data entry interface. When a title is entered, the title can be added to a notification list, such as notification list 92 of FIG. 4. The title can be added without a description. The program guide can determine whether the title for the program is in the current time frame, which can be stored in a local database of the program guide or at a remote server.

10 When there is a match, the program guide can retrieve the matching information (e.g., program description). Display screen 132 can include options for providing the user with the opportunity to specify the types of notification desired (e.g., remind, message, e-mail,

15 etc.).

After a user has set reminders for upcoming programs, the program guide can display a reminder list display screen, such as reminder list display screen 134 of FIG. 12. The program guide can

20 automatically display reminder list display screen 134 shortly before the start of the upcoming program. Display screen 134 can include an overlay containing a list of reminders which have been set by the user. The overlay can be displayed on top of the video for the

25 program that the user is currently watching. Display screen 134 can include a hide reminder option 136. When the user selects hide reminder option 136, the program guide can remove the overlay and return the user to viewing the current program. When the user

30 selects a specific program in the list, the program guide can tune immediately to the channel showing that program. The program guide can provide the user with the opportunity to view the reminder list at any time until the listed programs end. The opportunity to

selectively view the reminder list at any time can, for example, be provided by providing a predetermined key on a remote control. The list can include reminders other than notification reminders (e.g., reminders set  
5 for other features of the program guide), which can have been configured with a different configuration setup than for notification reminders.

Advance notification can be provided for programs that are coming soon. For example, the  
10 program guide can include a coming soon option, such as coming soon option 72 of FIG. 2. When coming soon option 72 is selected, the program guide can immediately display a list of upcoming programs (e.g., display screen 138 of FIG. 14) or can first display a  
15 selectable list of types of upcoming programs, such as coming soon display screen 140 of FIG. 13. Display screen 140 can contain a list of different types of upcoming programs in which the user can be interested. For example, as shown FIG. 13, the list can contain  
20 options for upcoming pay-per-view movies, upcoming special events, returning series, announced new series, upcoming programs on a specific channel, etc.

When a user selects an option from display screen 140, such as pay-per-view movies option 142, the  
25 program guide can display a coming soon display screen, such as coming soon display screen 138 of FIG. 14. Display screen 138 can contain a list of programs that match the selected program type (e.g., pay-per-view movies) and that are not yet within the current time  
30 frame of the program guide. The list can be sorted alphabetically or by any other appropriate criteria. The list can include upcoming programs that have been scheduled to air outside the current time frame of the program guide. If desired, the list can include

upcoming programs that have not yet been scheduled. For example, the list can include upcoming programs that have been announced but not yet scheduled. The list can include an indicator for a program, such as  
5 indicator 144. Indicator 144 can indicate that the user has already set a notification for that program. When the user selects a program from the list, the program guide can display a notification display screen for that program, such as notification display  
10 screen 116 of FIG. 6. Notification display screen 116 can provide the user with the opportunity to set, delete, or modify a notification for the program.

The user can be provided with the opportunity to setup the configuration of notifications. For  
15 example, when a user selects a setup option, such as setup option 74 of FIG. 2, the program guide can display a setup display screen, such as setup display screen 146 of FIG. 15. Setup display screen 146 can include notifications setup option 148. When a user  
20 selects notifications setup option 148, the program guide can display a notification setup display screen, such as notification setup display screen 150 of FIG. 16. Display screen 150 can include reminder notice setup option 152, message notice setup  
25 option 154, and e-mail notice setup option 154. If desired, setup display screen 146 can include an option for specifying whether reminders will be displayed on a television screen, a display remote, or both.

Reminder notice setup option 152 can provide  
30 the user with the opportunity to specify how far in advance of a start time of an upcoming program a reminder notification should be displayed. Values for how far in advance a reminder notice can be displayed can be set for example to be in the range of one to

fifteen minutes. If desired, reminder notice setup option 152 can not be provided and the program guide can use settings from a general reminders feature (e.g., non-notification reminders). When a program is  
5 not in a current time frame of the program guide, a reminder notification for that program can be set. Later, when the program guide determines that the program is now in the current time frame, the program guide can activate the reminder notification at an  
10 appropriate time before the start time of that program.

When a user selects message notice setup option 154, the program guide can provide the user with the opportunity to specify the message notice time. The user can set the notice to receive a message  
15 notification for a program a few hours before the program or as far ahead of the program as the available program guide data permits (e.g., the length of the current time frame). If desired, the program guide can use a default value for the message notice time (e.g.,  
20 one day) or can generate the notification message as soon as the program is added to the local program listings database of the program guide.

When a user selects e-mail notice setup option 156, the program guide can provide the user with  
25 the opportunity to specify the advance notice time for e-mail notifications. The values or defaults for advance notice time for e-mail notifications can be the same as the values for message notifications.

Notification setup display screen 150 can  
30 provide a user with the opportunity to specify an e-mail notification address. If desired, the program guide can allow the user to specify an individual e-mail address for each notification. If desired, the program guide can have an e-mail address for the

household as part of an e-mail feature, and can use that address, rather than requiring the user to enter the address again.

If desired, the program guide can provide the user with the opportunity to setup the configuration notifications for each individual program. For example, the program guide can display in a notification display screen (e.g., notification display screen 116 of FIG. 7) a notification setup option, such as notification setup option 119 of FIG. 7. When a user selects notification setup option 119, the program guide can display a notification setup display screen, such as notification setup display screen 150 of FIG. 16, to setup the notifications for that program.

An individual program notification setup can be available in addition to a general setup for notifications. If desired, a setup for notifications can include a general option that specifies whether reminders, messages, or e-mails should be generated whenever a program with a notification comes into the current time-frame of the program guide.

When the user sets a notification for a program, the program notification can be stored, preferably in non-volatile memory, at the user television equipment (e.g., user television equipment 44 of FIG. 1). If desired, when the program guide system is in a client-server arrangement, the program notification can be stored at a server (e.g., server 22 at television distribution facility 20 of FIG. 1).

When new schedule items are received by the program guide (either at server 22 or user television equipment 26), the incoming schedule items can be compared with the notification list (e.g., the programs

listed in notification list 92 of FIG. 4). When there is a match, the program guide can generate a notification for that program (e.g., reminder notification, e-mail notification, message notification etc.). The type of notification desired can have been set earlier from a display screen, such as notification display screen 116 of FIG. 7. The advance notice time for the notification can have been set earlier from a display screen, such as notification setup display screen 150 of FIG. 16.

For example, when a reminder notification has been set for a program that is determined to be in the current time frame, the program guide can schedule a reminder overlay for a specified number of minutes prior to the start of the program. When a message or e-mail notification has been set, the program guide can immediately generate a notification or can schedule a task to generate a message or e-mail notification an appropriate number of days or hours prior to the scheduled start of the program.

Illustrative steps involved in providing a notification feature are shown in FIG. 17. At step 152, the program guide can provide the user with the opportunity to select or specify an upcoming program which is not yet in the current program listings time frame of the program guide.

If desired, step 152 can include informing the user of an upcoming program (step 154). For example, the program guide can display a coming soon display screen (e.g., coming soon display screen 140 of FIG. 13). The program guide can display a different coming soon display screens based on category, type, actor, genre, etc. (e.g., coming soon display screen 138 of FIG. 14). The program guide can send a

message to a user announcing an upcoming program that is not yet in the program listings database of the program guide. The program guide can display advertisements for upcoming programs which are not in  
5 the current program listings time frame.

At step 152, the program guide can provide the user with the opportunity to select an upcoming program from a coming soon display screen (e.g., coming soon display screen 138 of FIG. 14), a message display  
10 screen (e.g., message display screen 102 of FIG. 6), a new notification display screen (e.g., by entering a program title or partial title from new notification display screen 132 of FIG. 11), a coming soon display screen for a category, such as genre, actor, rating,  
15 etc. (e.g., coming soon display screen 138 of FIG. 14 for upcoming pay-per-view programs), etc.

At step 156, the program guide can display information and user-selectable options that are related to the selected program. For example, the  
20 program guide can display a description, title, graphics, etc. about the selected program. As for user-selectable options, the program guide can provide the user with the opportunity to select an option to set a message notification (e.g., message option 122 of  
25 FIG. 7), to select an option to set an e-mail notification (e.g., e-mail option 124 of FIG. 7), to select an option to track a program (e.g., the program will be added to the notification list but no notification will be generated), to select an option to  
30 set a reminder notification (e.g., remind option 120 of FIG. 7), to select an option to purchase the selected program (e.g., order option 108 of FIG. 6), to select an option to have the program guide automatically tune to the channel carrying the select program at or about

the time of airing, to select an option to have the program guide automatically cause the program to be recorded when the program airs, etc.

When the user selects an option, the program guide can provide the user with the opportunity to setup features related to the option. For example, the program guide can provide the user with the opportunity to select how far in advance a message, e-mail, or reminder notification should be sent. For purchase, tune, and record options, the program guide can provide the user with the opportunity to specify parameters, such as day of the week, time of day, etc. For example, the user can be allowed to select to a time range in which the program guide is authorized to purchase, tune, or record a program.

At step 158, when the user has selected an option, the program guide can collect information on which programs and which options have been selected (step 158a). The information can be collected at a central location (e.g., television distribution facility 20 of FIG. 1). The information can be used to influence the scheduling of programming, the marketing of programming, the distribution of programming, and the targeting of advertisements, and to generate e-mail notifications.

Step 158 can include providing the user with the opportunity to view or modify notifications set for programs (step 158b). For example, the program guide can provide the user with the opportunity at any time to view a notifications list (e.g., notifications list 92 of FIG. 4). An item in the notification list can be automatically removed from the list after a selected notification has been provided or can be removed a predetermined number of days after the



program has been received within the local program guide database (e.g., the current program listing time frame). If desired, an item in the list can be removed after the program has been viewed or after the program  
5 is no longer available in the current time frame. The list can include an indication of which programs are presently in the current time frame of the program guide. From the notification list, the user can be provided with the opportunity to access a notification  
10 display screen (e.g., notification display screen 116 of FIG. 7) in order to view, modify, or delete a notification that has been set for a program.

Step 158 can include providing a notification for a selected program which is now in the current  
15 program listings time frame (step 158c). When the user has set a notification message or reminder, the program guide can display a reminder notification or send a message notification when the program is determined to be in the current time frame of the program guide. If  
20 desired, a message notification can be sent or a reminder notification can be displayed at a predetermined notice time prior to the airing of the program. When the user has set an e-mail notification, an e-mail notification can be sent when it is  
25 determined that the program is in the current time frame of the program guide. If desired, the e-mail notification can be sent at a predetermined time prior to the airing of the program. The e-mail notification can be sent from a central facility (e.g., television  
30 distribution facility 20 of FIG. 1) or the program guide can generate the e-mail notification locally at user television equipment (e.g., user television equipment 26 of FIG. 1). After a notification has been provided, the status of a notification in the

notification list can be modified (e.g., the program can be removed from the list when all the notifications which had been set by user have been performed). At step 158c, the program guide can provide notification options, such as to tune or record the selected program.

In the following discussion below with reference to FIG.'s 18 through 32, the present invention is discussed sometimes primarily in the context of a program guide system with a mouse, a keyboard, or both as a user interface device (e.g., an on-line PC based program guide system). It is to be understood that the present invention is not limited to such an arrangement.

FIG. 18A shows an illustrative program guide display screen that can be provided in a PC based program guide system. Display screen 218 contains program listings 220 that can be organized in channel order from top to bottom and by broadcast time from left to right. Cursors 222 and 224 can be used to navigate to earlier or later time periods, respectively. Browser cursors 226 and 228 allow a user to scroll through program listings 220. The user can also navigate through program listings 220 with time navigation buttons 230 to view program listings for different times in the day. Calendar buttons 232 can be used to view program listings for different days of a month. The user can choose between various available view options by selecting a desired time, channel, category, or search button from among view buttons 234.

FIG. 18B shows an illustrative coming soon program display screen 310 that can be provided as an option from the display screen 218 of FIG. 18A, or can be accessed independently. The user can activate the

coming soon program display screen from display screen 218 of FIG. 18A by means of box 236. Included on the coming soon program screen are non-frame television programs which are outside the current display time frame. For example, in FIG. 18B, there are several movies, including Titanic, The General, and Saving Private Ryan, all of which (at least for the purposes of this description) have not yet been released on cable television.

10           Program guide screen 310 can also include one or more markers 312 that indicate that information regarding other programs is now available to the user (e.g., a listing for Rushmore is in the current time frame). When data regarding a non-frame television program is added, the non-frame television program by definition becomes an in-frame television program. The marker can be, for example, an icon, a color, a display order, and any combination thereof. More than one type of marker can be used on a single screen to indicate more than one type of information regarding the television program. For example, a star placed next to the listing can indicate that the program will be broadcast on a pay-per-view channel and an underline can indicate optional on-line links to more information and promotional offers.

25           If a program is selected from coming soon display screen 310 of FIG. 18B, the user can be presented with a notification order display screen, such as notification order display screen 410 of FIG. 19. Notification order display screen 410 can contain user-selectable options for ordering a notification. Notifications can notify the user when a particular television program is to be broadcast. As defined herein, the term "broadcast" refers to the

process of airing scheduled television programs by traditional television broadcast techniques, cable systems, or satellite systems. It will be appreciated that the methods and apparatus described herein can  
5 also be used in connection with non-frame videos-on-demand.

FIG. 19 shows fields 414 and 418 in notification order display screen 410, which allow the user to enter a name and electronic mail address,  
10 respectively, of the person receiving the notification. If desired, the user's name and electronic mail address can be automatically entered in fields 414 and 418 based on information previously provided to the system (e.g., information provided when the user registered  
15 with the television program guide service). Use of electronic mail to remind users of program events which are in the current time frame is known (See, United States Patent Application No. 08/987,740, filed December 9, 1997, which is hereby incorporated by  
20 reference in its entirety).

If the user is browsing program listings from a computer located at the user's office, the user can wish to have notifications addressed to his home (i.e., using his personal Internet access account and the  
25 electronic mail address for the system at home). Alternatively, the user can wish to have notifications sent to an office electronic mail address. If the user has a common electronic mail address for both home and the office, notifications can be accessed at either  
30 location. If desired, the system can provide more than one field 418 (e.g., field 421) so that notifications can be sent to more than one electronic mail address.

Notification order display screen 410 of FIG. 19 can also provide several user-selectable

options that specify when and how often the user will be notified of the airing of selected non-frame television programs. For example, notification order screen 410 can contain notify me box 424. Selecting an option in notify me box 424 allows the user to specify how often the system will generate and send a notification to the user. As shown in FIG. 19, the options in notify me box 424 can allow the user to be notified of the selected program only once, each time the program is being broadcast, each time the program is broadcast in a month, or at some other specified time. If "other" in notify me box 424 is selected, the user can be presented with screen 510 shown in FIG. 20. Such options can be selected with a mouse, keyboard, or any other suitable interface device. Screen 510 allows a user to specify a time period during which notifications will be generated and sent. The user can specify a time period by entering information in box 513.

Notification order display screen 410 of FIG. 19 can also contain how soon box 430. Selecting an option in box 430 allows the user to indicate how soon before the broadcast of the selected program notifications are to be generated and sent to the user. As shown in FIG. 19, box 430 can contain options that allow the user to be notified 1 hour, 1 day, 2 days, or another predetermined period of time before the selected program is broadcast. If "other" is selected in box 430, the user can be presented with display screen 510 of FIG. 21, which allows the user to specify a desired lead time before a scheduled event by completing box 515.

Upon completing display screen 510 of FIG. 21, the user can submit the information that has

been entered by selecting enter button 517. The user can exit display screen 510 without submitting the information by selecting exit button 519. If the user selects either enter button 517 or exit button 519, the  
5 user can be returned to the previous screen, such as notification order display screen 410.

The options that the user selects in boxes 424 and 430 of order display screen 410 determine, respectively, how often and when  
10 notifications will be sent. For example, a user can select a program from coming soon program display screen 310 of FIG. 18B. When the user selects a program from display screen 310 of FIG. 18B, the user can be presented with order display screen 410 of  
15 FIG. 19. If the user selects the "1 hour" option in box 430 and the "each time being broadcast" option in notify me box 424, the user will receive notifications (assuming fields 414 and 418 are completed with the user's own information) 1 hour before each broadcast of  
20 the program.

At any time during the completion of notification order display screen 410 (FIG. 19), the user can cancel the notification order by selecting cancel box 480. Selecting cancel box 480 can return  
25 the user to display screen 310 of FIG. 18B. Upon completing order notification display screen 410, the user can submit a notification order for processing by selecting submit box 440.

FIG. 21 shows an illustrative electronic mail  
30 notification 600. Notification 600 can display electronic mail address 611 of the person to whom the mail is being sent, name 613 of the program for which the notification is being sent, and information on when the television program is to be broadcast. The user

can delete notification 600 by selecting delete button 618. An advertisement 620 (text, graphics, video etc.) can be included in or attached to the notification if desired. The advertisement can be  
5 provided using information stored in a remote or local database, such as databases 16, 24, or 36.

Notification 600 can also include interactive links to various screens and services, including, but not limited to a link to program guide display  
10 screen 218 and a link promotional offers that can or can not be interactive. When a user selects interactive options 625 and 626, program events can be automatically ordered/tuned, or recorded. If desired, these options can be automatically removed from the  
15 notification after being selected by a user to reduce clutter on the notification. The options can also be automatically removed after a predetermined period of time following a particular event. A particular event can occur (1) when data regarding the program is  
20 received by a local database, (2) when data regarding the program is received by a remote server, or (3) when the user is notified.

Another aspect of the invention relates to management of one's notifications. If desired,  
25 notification order display screen 410 of FIG. 19 can contain view current box 483. If view current box 483 is selected, the user can be presented with illustrative current notifications display screen 710 of FIG. 22. Another way that the user can reach  
30 current notifications screen 710 of FIG. 22 is by selecting view current notifications button 233 in display screen 218 of FIG. 18A. Current notifications display screen 710 contains a list of all the user's currently requested notifications. Information, such

as the program name, type of notification, and the date and time submitted can be displayed.

FIG. 22, shows an illustrative example of a current notification entry for the program "Primal Fear". This notification was submitted by the user on November 1, 1997 at 3:03 p.m. and is set to notify the user one hour before each broadcast. Entries can be added to the current notification list as soon as the user sets a new notification (e.g., by selecting submit button 440 from order notification screen 410 of FIG. 3). When an item in list is selected (e.g., positioning a highlight region on an item and pressing a data entry key), display screen 410 of FIG. 19 can be displayed to allow the user to modify the notification configuration for the selected item in the list. If desired, the user can be provided with the opportunity to change the configuration for an item in the list from the same display screen, display screen 710. An item can be removed from the list (e.g., by positioning a highlight region on an item and selecting cancel 712).

Another component of display screen 218 is new notifications box 231. New notifications box 231, which can be adjacent to the program navigation controls of display 218, allows the user to order notifications without using program listings 220. If new notifications box 231 is selected, the user can be presented with illustrative new notifications display screen 810 of FIG. 24.

New notifications screen 810 contains user-selectable options similar to the options contained in notification order display screen 410 of FIG. 19. For example, new notifications display screen 810 contains user information box 813, how soon box 830, and notify me box 824. However, new notifications screen 810



allows the user to enter the title of a non-frame television program.

If the user does not enter the exact title of the non-frame television program in new notifications display screen 810, the data in the database 16, 24, or 36 or any other suitable set of television program listings data can be scanned to find the program or programs that most closely match the program title indicated by the user. If several matches are found, a list of the program matches can be presented to the user and the user can choose the actual program desired. Once the user has chosen a program from the list, the program title in box 818 can be automatically updated. If no matches are found, or if the user does not accept one of the offered choices, the title can be left as entered.

A user can exit new notifications display screen 810 at any time by selecting exit button 880. Selecting exit button 880 can return the user to display screen 218 of FIG. 18A.

Upon completing new notifications display screen 810, the user can submit the notification order for processing by selecting submit box 840. Selecting submit box 840 allows program guide system 10 (FIG. 1) to process the request. The request can be processed in the same way a notification request can be processed when ordered from notification order display screen 410 of FIG. 19.

The user can reach current notifications display screen 710 of FIG. 22 from new notifications display screen 810 of FIG. 23 by selecting view current notifications button 883.

The foregoing is merely illustrative of the principles of this invention and various modifications

can be made by those skilled in the art without departing from the scope and spirit of the invention.

What is Claimed is:

1. A method of providing interactive options for non-frame television programs using a system, the system having a current display time frame, the non-frame television programs being outside the current display time frame, the method comprising:

presenting on a display screen at least one option that corresponds to a non-frame television program;

allowing the user to select a first of said at least one option; and

providing the user a service associated with said first option.

2. The method of claim 1 wherein said system is a television program guide system.

3. The method of claim 2 further comprising determining at least one valid option from a plurality of possible options, wherein said presenting comprises presenting said at least one valid option.

4. The method of claim 2 further comprising:

receiving data that corresponds to said non-frame television program; and

wherein said presenting comprises presenting at least some of said data to the user.

5. The method of claim 4 further comprising:

storing said data in a database after said receiving; and

wherein said presenting comprises presenting at least some of said data stored in said database to the user.

6. The method of claim 5 wherein said presenting comprises notifying said user using a method selected from a group consisting of on-screen and on-line methods.

7. The method of claim 6 wherein said notifying comprises notifying said user according to at least one procedure selected from a group consisting: (a) notifying said user after said data is received by a local database, (b) notifying said user after said data is received by a remote server, (c) notifying said user on a day that said program is broadcast, (d) notifying said user at a predetermined period of time before said program is broadcast, (e) notifying said user after receiving a request from said user, and (f) any combination thereof.

8. The method of claim 6 further comprising:

providing to said user the ability to select a predetermined period of time before said notifying; and

wherein said notifying comprises notifying said user at said predetermined period of time before said program is broadcast.

9. The method of claim 5 wherein said presenting comprises notifying said user with electronic mail.

10. The method of claim 9 further comprising:

providing to said user the ability to select a predetermined period of time before said notifying; and

wherein said notifying comprises notifying said user at a predetermined period of time before said program is broadcast.

11. The method of claim 2 wherein said presenting comprises displaying a program guide screen that includes a marker that indicates that information regarding a program is included in a program guide database.

12. The method of claim 2 wherein said presenting comprises displaying a program guide screen that includes a notification list comprising said first option, said first option being identifiable with a marker selected from a group consisting of an icon, a color, a display order, and any combination thereof when data regarding said non-frame television program is added to a program guide database, said non-frame television program thereby becoming an in-frame television program.

13. The method of claim 2 wherein said presenting comprises displaying a program notification on a program guide screen.

14. The method of claim 13 further comprising:

storing information regarding said non-frame program in a program guide database; and

wherein said displaying comprises displaying said notification immediately before said program is broadcast.

15. The method of claim 13 further comprising:

storing information regarding said non-frame program in a program guide database; and

wherein said displaying a program notification includes displaying an option to tune to said program.

16. The method of claim 13 wherein said displaying interrupts another television program.

17. The method of claim 13 further comprising:

providing to said user the ability to specify notification parameters before said notifying; and

wherein said notifying comprises notifying said user at a predetermined period of time before said program is broadcast.

18. The method of claim 13 wherein said displaying a program notification includes displaying an option to record a program.

19. The method of claim 2 wherein said presenting comprises presenting the user with an option to purchase a pay-per-view non-frame television program when the program is in-frame.

20. The method of claim 2 wherein said presenting comprises presenting the user with an option to automatically tune to a channel carrying said program when said program is broadcast.

21. The method of claim 2 wherein said presenting comprises presenting the user with an option to automatically record said program on a recording device when said program is broadcast.

22. The method of claim 2 wherein said at least one option is a notification list of options, said method further comprising automatically removing said first option from said list after said providing.

23. The method of claim 2 wherein said at least one option is a notification list of options, said method further comprising automatically removing said first option from said list after a predetermined period of time following an event, wherein said event is selected from a group consisting of (1) the time when data regarding said program is received by a local database, (2) the time when data regarding said program is received by a remote server, and (3) the time when said user is presented with said at least one option.

24. The method of claim 2 wherein said presenting is in response to a user request, said presenting comprising presenting a notification list including said at least one option.

25. The method of claim 24 wherein said notification list further includes at least one option that corresponds to an in-frame television program,

said presenting comprising presenting said at least one option in said list such that said in-frame and non-frame options are distinguishable to said user.

26. A method for providing notifications of non-frame television programs to a user using a system, the system having a current display time frame, the non-frame television programs being outside the current display time frame, the method comprising:

allowing the user to specify a non-frame television program outside of the current display time frame with a set-top box in the system; and

notifying the user with the system when the non-frame television program is now in-frame and is to be broadcast.

27. The method of claim 26 wherein said system is a television program guide system.

28. The method of claim 27 further comprising providing a notification option which the user selects to order notifications.

29. The method of claim 28 wherein said notification option includes a how soon option for determining how soon before the broadcast of the non-frame television program the notification is to be generated and sent to the user.

30. The method of claim 27 further comprising providing a view current notifications option which the user selects to receive a list of current notification orders.



31. The method of claim 27 further comprising providing a new notifications option that the user selects to order a notification by entering a program title.

32. An apparatus for providing notifications of non-frame television programs to a user using a television program guide system, the television program guide system having a current display time frame, the non-frame television programs being outside the current display time frame, the apparatus comprising:

means for allowing the user to specify a non-frame television program outside of the current display time frame; and

means for notifying the user when the non-frame television program is now in-frame and is to be broadcast.

33. The apparatus of claim 32 further comprising means for providing a notification option which the user selects to order notifications.

34. The apparatus of claim 33 wherein the means for providing a notification option includes means for providing a how soon option for determining how soon before the broadcast of the non-frame television program the notification is to be generated and sent to the user.

35. The apparatus of claim 33 wherein the means for providing a notification option includes means for providing a how often option for determining how often the notification is to be generated and sent to the user.

36. The apparatus of claim 32 further comprising providing means for providing a view current notifications option which the user selects to receive a list of current notification orders.

37. The apparatus of claim 32 further comprising means for providing a new notifications option which the user selects to order a notification by entering a program title.

38. An apparatus for providing interactive options for non-frame television programs on a display screen of a television program guide system, the television program guide system having a current display time frame, the non-frame television programs being outside the current display time frame, the method comprising:

means for presenting on said display screen at least one option that corresponds to a non-frame television program;

means for allowing the user to select a first of said at least one option; and

means for providing the user a service associated with said first option.

39. The apparatus of claim 38 further comprising means for determining at least one valid option from a plurality of possible options, wherein said means for presenting can present said at least one valid option.

40. The apparatus of claim 39 further comprising:

means for receiving data that corresponds to said non-frame television program; and wherein said means for presenting can present at least some of said data to the user.

41. The apparatus of claim 40 further comprising:

a database for storing said data after said data is received; and

wherein said means for presenting can present at least some of said data stored in said database to the user.

42. The apparatus of claim 41 wherein said means for presenting can notify said user using a method selected from a group consisting of on-screen and on-line.

43. The apparatus of claim 42 wherein said means for notifying can notify said user according to at least one procedure selected from a group consisting: (a) notifying said user after said data is received by a local database, (b) notifying said user after said data is received by a remote server, (c) notifying said user on a day that said program is broadcast, (d) notifying said user at a predetermined period of time before said program is broadcast, (e) notifying said user after receiving a request from said user, and (f) any combination thereof.

44. The apparatus of claim 42 further comprising:

means for providing to said user the ability to select a predetermined period of time before said notifying; and

wherein said means for notifying can notify said user at said predetermined period of time before said program is broadcast.

45. The apparatus of claim 41 wherein said means for presenting can notify said user with electronic mail.

46. The apparatus of claim 45 wherein said means for notifying can notify said user according to at least one procedure selected from a group consisting: (a) notifying said user after said data is received by a local database, (b) notifying said user after said data is received by a remote server, (c) notifying said user on a day that said program is broadcast, (d) notifying said user at a predetermined period of time before said program is broadcast, (e) notifying said user after receiving a request from said user, and (f) any combination thereof.

47. The apparatus of claim 45 further comprising:

means for providing to said user the ability to select a predetermined period of time before said user is notified; and

wherein said means for notifying can notify said user at a predetermined period of time before said program is broadcast.

48. The apparatus of claim 38 wherein said means for presenting can display on said display screen

a marker that indicates that information regarding a user-selected program is included in a program guide database.

49. The apparatus of claim 38 wherein said means for presenting can display a program notification on said program guide screen.

50. The apparatus of claim 49 further comprising:

a program guide database for storing information regarding said non-frame program; and  
wherein said means for displaying can display said notification immediately before said program is broadcast.

51. The apparatus of claim 50 further comprising:

a program guide database for storing information regarding said non-frame program to; and  
wherein said means for displaying can display an option to tune to said program.

52. The apparatus of claim 49 wherein said means for displaying can interrupt another television program.

53. The apparatus of claim 49 further comprising:

means for providing said user the ability to specify notification parameters before said user is notified; and

wherein said means for notifying can notify said user at a predetermined period of time before said program is broadcast.

54. The apparatus of claim 49 wherein said means for displaying a program notification can display an option to record a program.

55. The apparatus of claim 38 wherein said means for presenting can present the user with an option to purchase a pay-per-view non-frame television program when the program becomes in-frame.

56. The apparatus of claim 38 wherein said means for presenting can present the user with an option to automatically tune to a channel carrying said program when said program is broadcast.

57. The apparatus of claim 38 wherein said means for presenting can present the user with an option to automatically record said program on a recording device when said program is broadcast.

58. The apparatus of claim 38 wherein said at least one option is a notification list of options, said apparatus further comprising means for automatically removing said first option from said list after said first option is provided.

59. The apparatus of claim 38 wherein said at least one option is a notification list of options, said apparatus further comprising means for automatically removing said first option from said list after a predetermined period of time following an

event, wherein said event is selected from a group consisting of (1) the time when data regarding said program is received by a local database, (2) the time when data regarding said program is received by a remote server, and (3) the time when said user is presented with said at least one option.

60. The apparatus of claim 38 wherein said presenting can be in response to a user request, and wherein said means for presenting can present a notification list including said at least one option.

61. The apparatus of claim 60 wherein said notification list further includes at least one option that corresponds to an in-frame television program, and wherein said means for presenting can present said at least one options in said list such that said in-frame and non-frame options are distinguishable to said user.

62. A system comprising:

a television distribution facility that provides (1) television programming, (2) television program listings that cover only television programming from the present through a predetermined time period, and (3) notifications of upcoming television programs scheduled to be broadcast after the predetermined time period; and

a plurality of user television equipment devices, wherein each of said devices is connected to the television distribution facility, and wherein each of said devices is configured to:

receive and display the television programming provided by the television distribution facility;

receive and display the television program listings that cover only the television programming from the television programming from the present through the predetermined time period; and

receive and display the notifications of the upcoming television programs scheduled to be broadcast after the predetermined time period, wherein the notifications are not part of the television programming.

63. A method for receiving notifications for upcoming programs, comprising:

providing a user with the opportunity to select a program that will air outside a program listings time frame which is currently available to the user; and

providing a notification to the user of the availability of the selected program during when the selected program is now in the current program listings time frame.

64. The method defined in claim 63 further comprising displaying a list of programs for which a notification is to be provided.

65. The method defined in claim 63 wherein providing a notification includes providing an e-mail notification.

66. The method defined in claim 63 wherein providing a notification includes providing a message notification.



67. The method defined in claim 63 wherein providing a notification includes providing a reminder notification.

68. The method defined in claim 63 further comprising providing the user with the opportunity to setup a configuration of the notification.

69. A program guide system, comprising:  
user equipment that is configured to provide a user with the opportunity to select a program that will air outside the program listings time frame which is currently available to the user, and is further configured to provide a notification to the user of the availability of the selected program when the selected program is now in the current program listings time frame.

70. The system defined in claim 69 wherein the user equipment is user television equipment.

71. The system defined in claim 69 wherein the user equipment is user personal computer equipment.

71. The system defined in claim 69 wherein the user equipment is further configured to display a list of programs for which a notification is to be provided.

71. The system defined in claim 69 wherein the user equipment is configured to provide an e-mail notification.

72. The system defined in claim 69 wherein the user equipment is configured to provide a message notification.

73. The system defined in claim 69 wherein the user equipment is configured to provide a reminder notification.

74. The system defined in claim 69 wherein the user equipment is configured to provide the user with the opportunity to setup a configuration of the notification.

75. In a user television equipment, a method for receiving notifications for upcoming programs, comprising:

providing a user with the opportunity to specify a program that will air outside a current program listings time frame of user television equipment; and

displaying a notification of the availability of the selected program during when the selected program is now in the current program listings time frame of the user television equipment.

76. The method defined in claim 75 further comprising displaying a list of programs for which a notification is to be provided.

77. The method defined in claim 75 wherein displaying includes displaying a message notification.

78. The method defined in claim 75 wherein displaying includes displaying a reminder notification.

79. The method defined in claim 75 further comprising providing the user with the opportunity to setup a configuration of the notification.

80. A program guide system, comprising user television equipment that is configured to provide a user with the opportunity to select a program that will air outside the current program listings time frame of the user television equipment, and is further configured to display a notification of the availability of the selected program when the selected program is now in the current program listings time frame of the user television equipment.

81. The system defined in claim 80 wherein the user television equipment is further configured to display a list of programs for which a notification is to be provided.

82. The system defined in claim 80 wherein the user television equipment is configured to display a message notification.

83. The system defined in claim 80 wherein the user television equipment is configured to display a reminder notification.

84. The system defined in claim 80 wherein the user television equipment is configured to provide the user with the opportunity to setup a configuration of the notification.

ELECTRONIC PROGRAM GUIDE  
WITH ADVANCE NOTIFICATION

Abstract of the Disclosure

A non-frame television program guide  
5 notification system is provided. The system allows a  
user at a system to order and receive notifications of  
non-frame television programs. The user can order  
notifications by selecting a program or supplying a  
program title directly. The user can specify when and  
10 how often the notifications will be generated and  
received. If desired, the user can view a list of all  
currently requested notifications. Entries can be  
added to the list or the user can cancel a previously  
ordered notification.

10

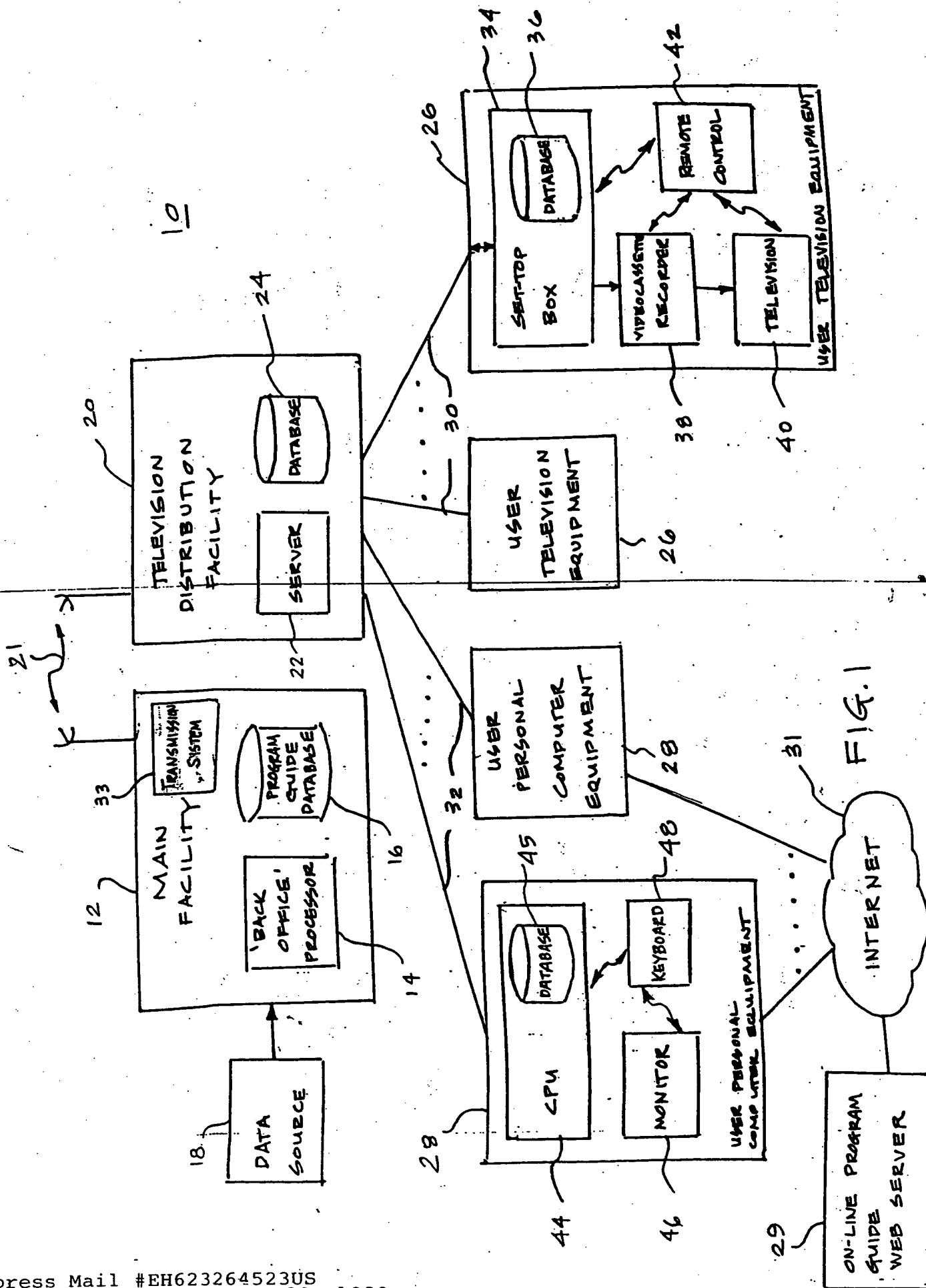


FIG. 1

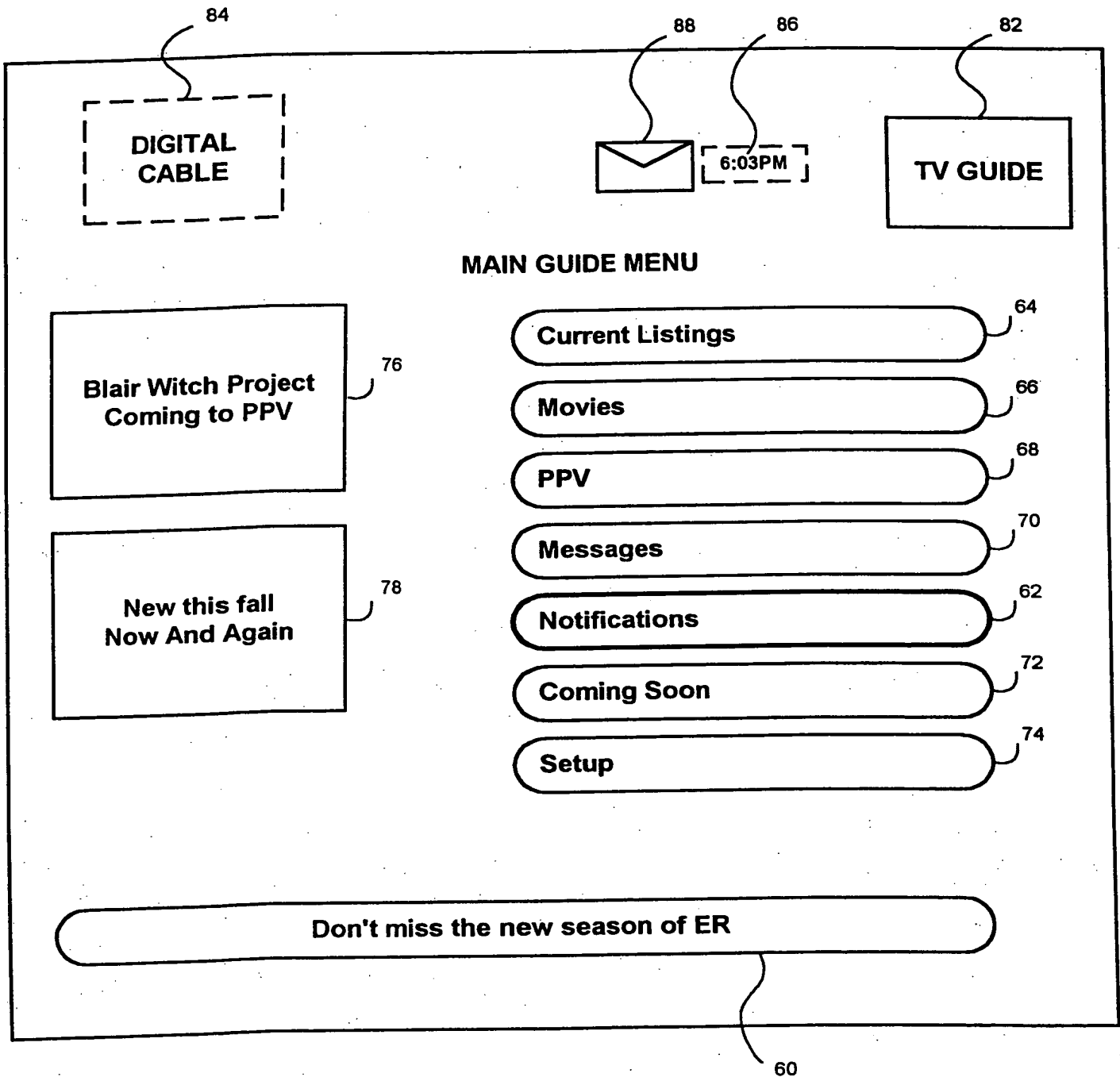


FIG. 2

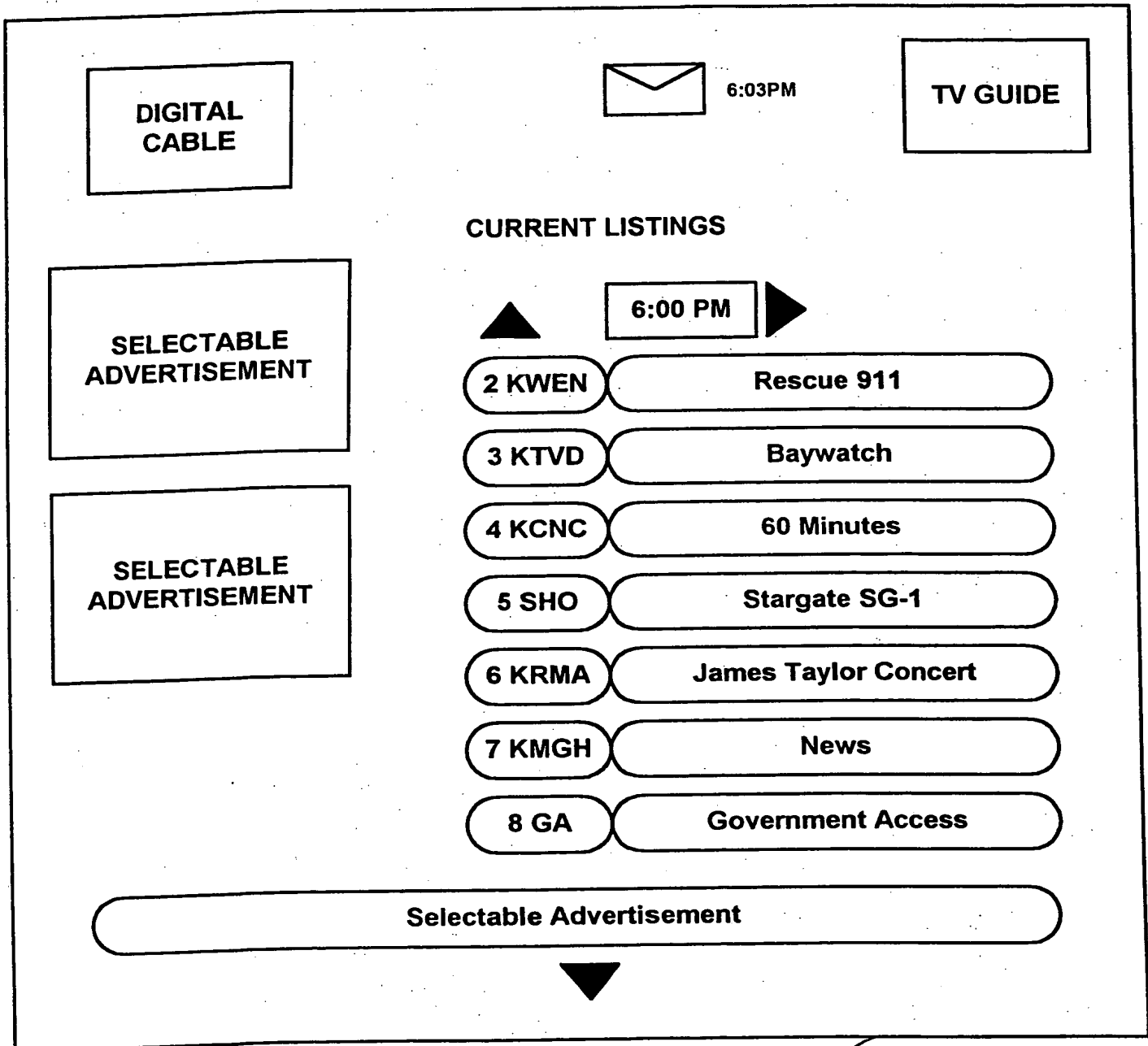


FIG. 3

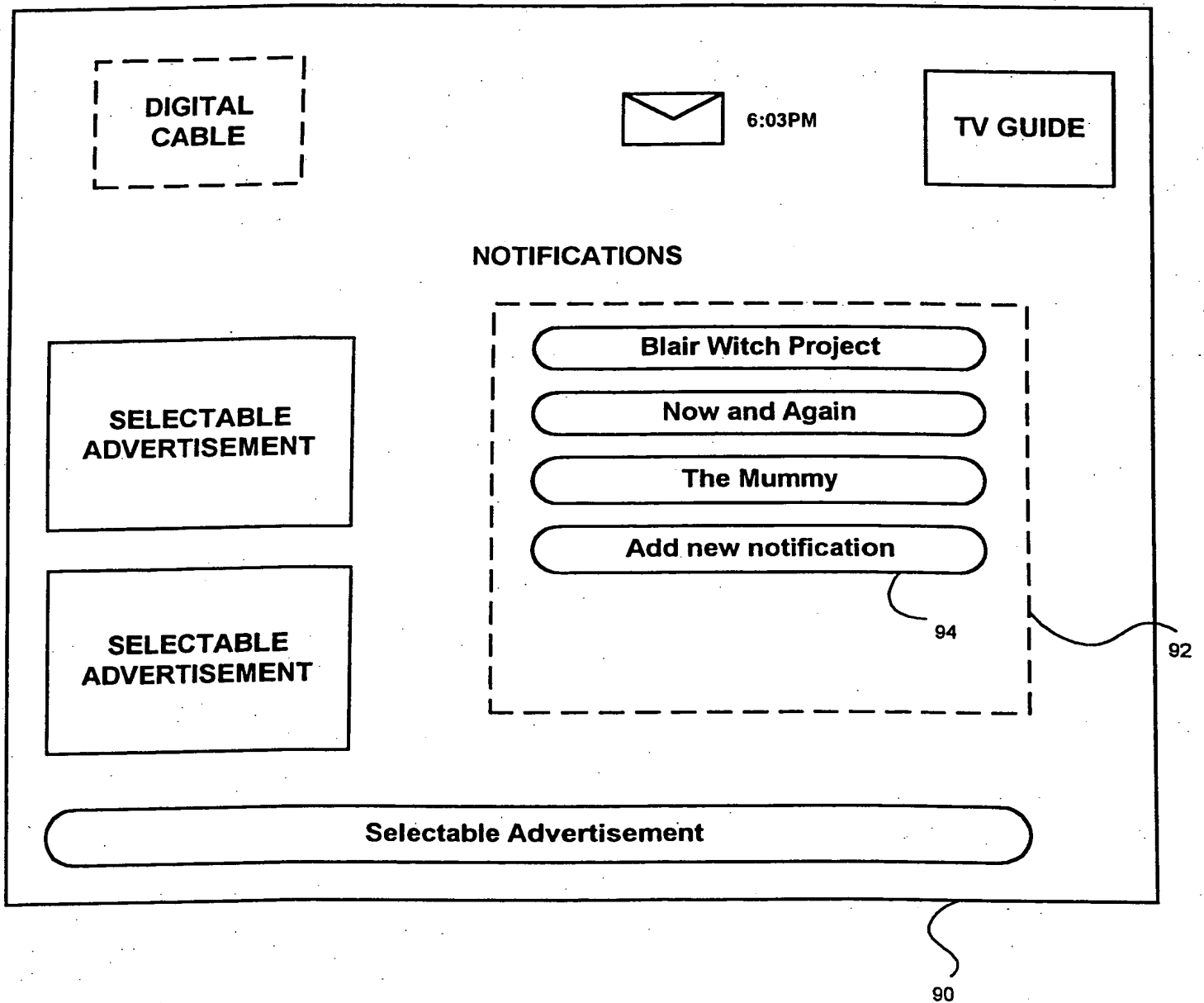


FIG. 4



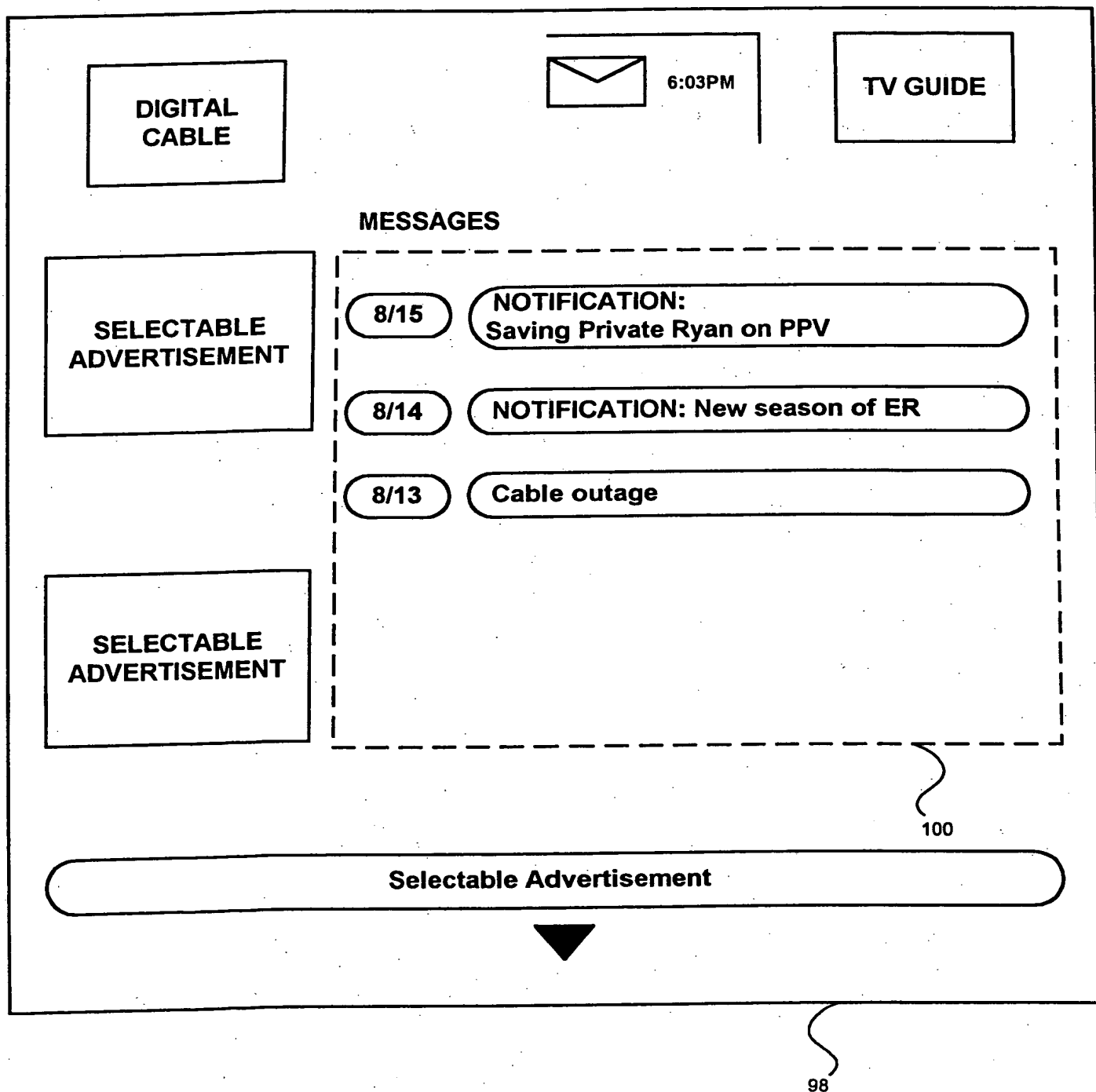


FIG. 5

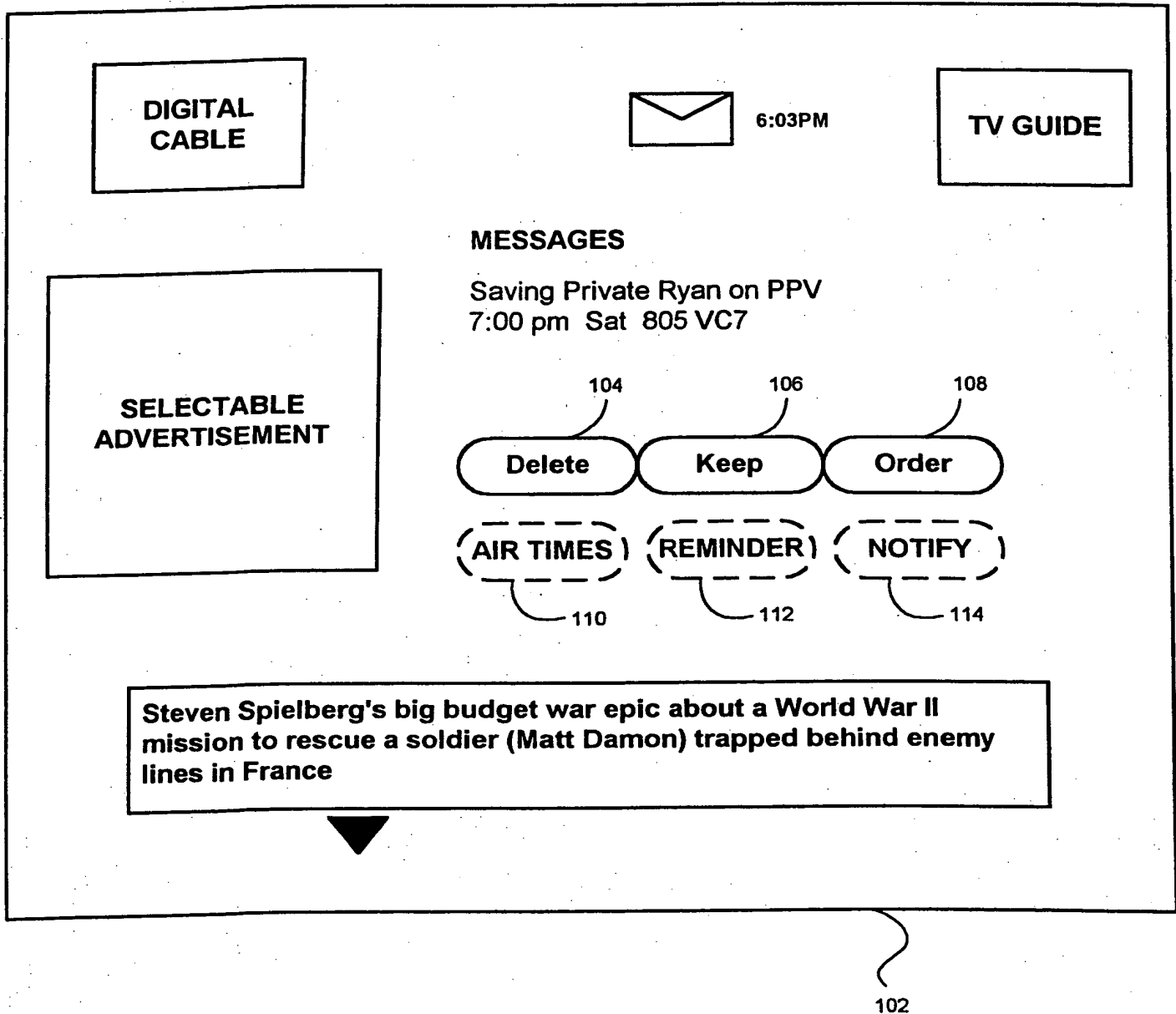


FIG. 6

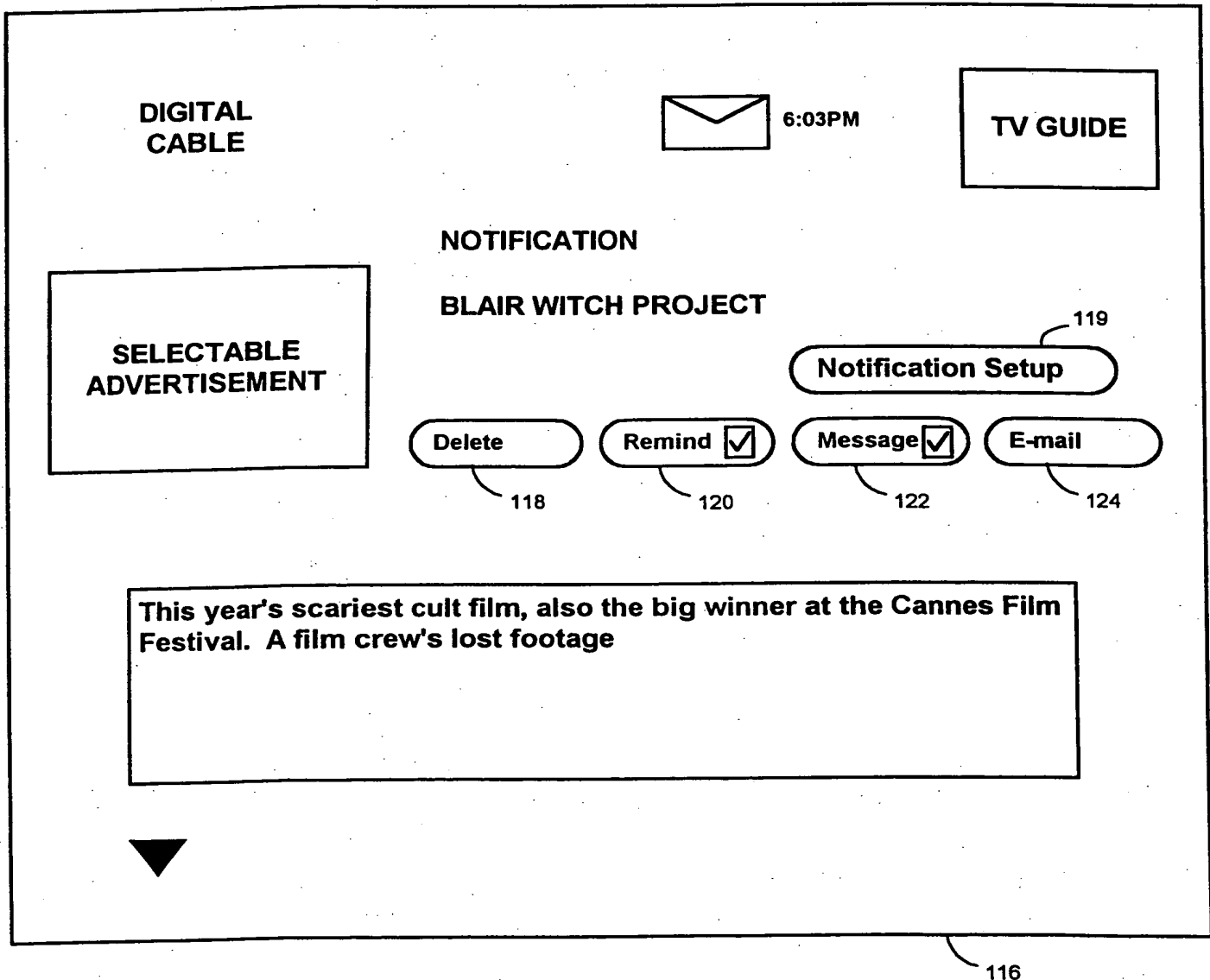


FIG. 7

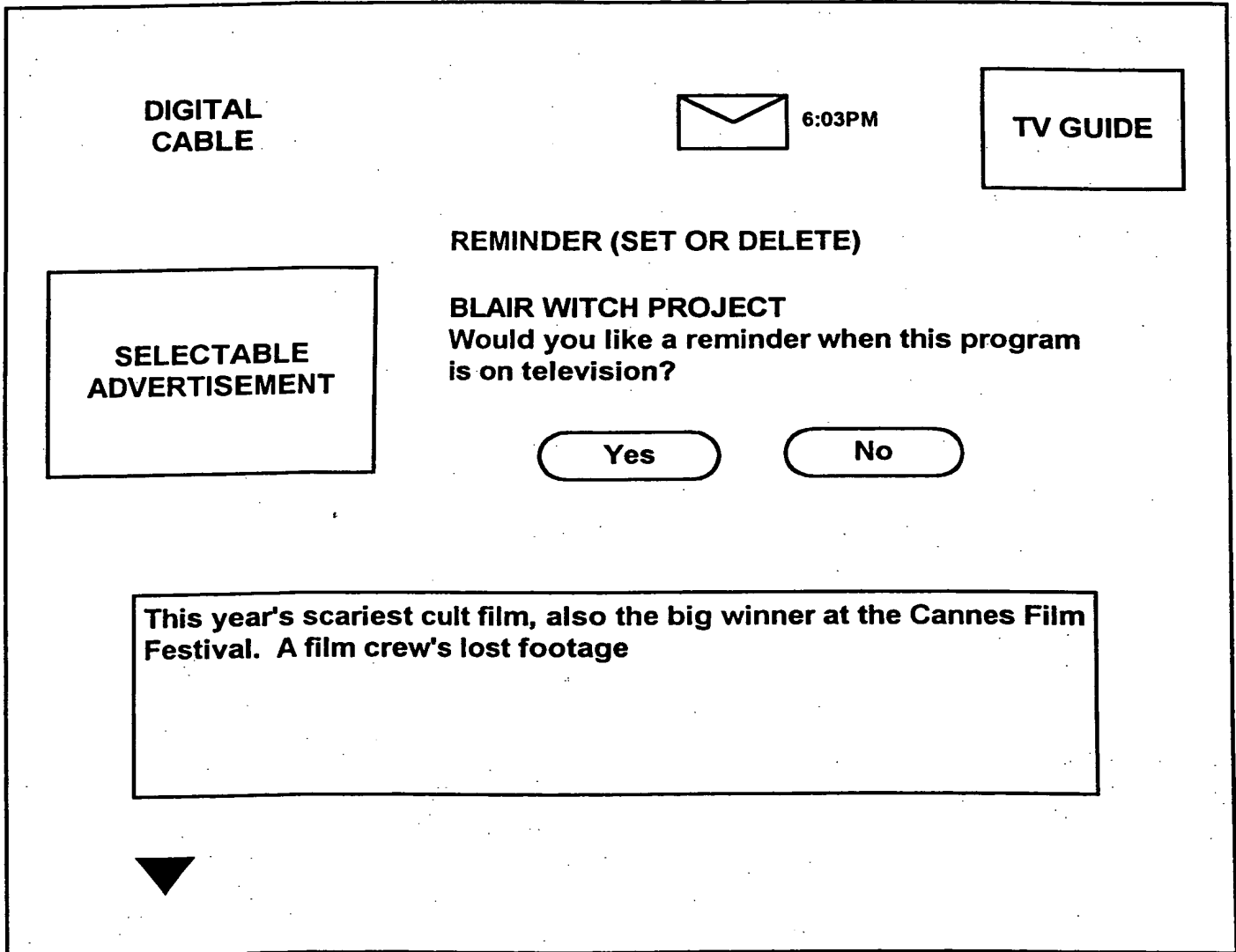


FIG. 8

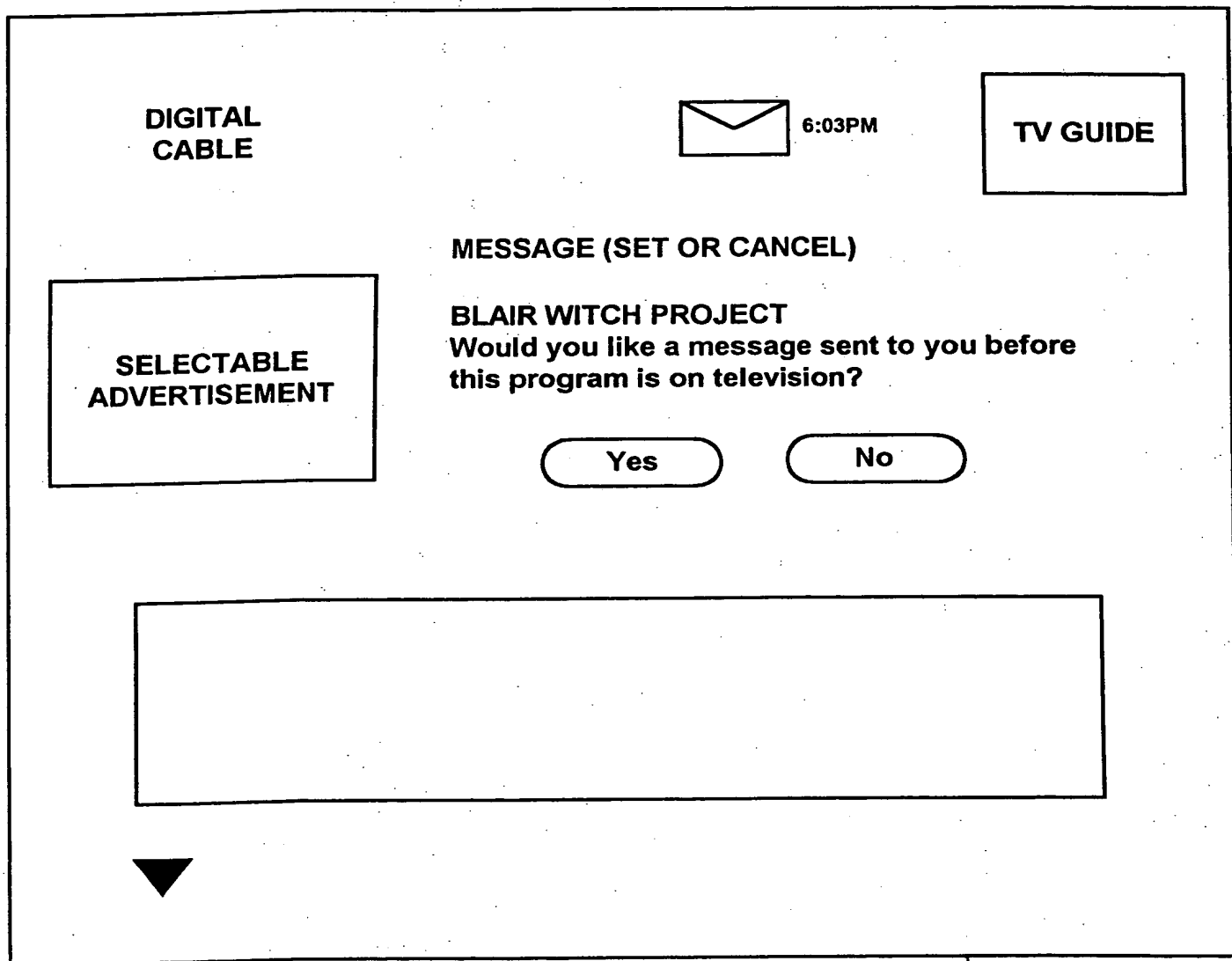


FIG. 9

DIGITAL  
CABLE

6:03PM

TV GUIDE

SELECTABLE  
ADVERTISEMENT

E-MAIL

**BLAIR WITCH PROJECT**  
Would you like an e-mail message when this  
program is scheduled to be shown on  
television?


Yes No

Enter your e-mail address

130

FIG. 10

DIGITAL  
CABLE

 6:03PM

TV GUIDE

SELECTABLE  
ADVERTISEMENT

NEW NOTIFICATION

Enter the title:

Remind

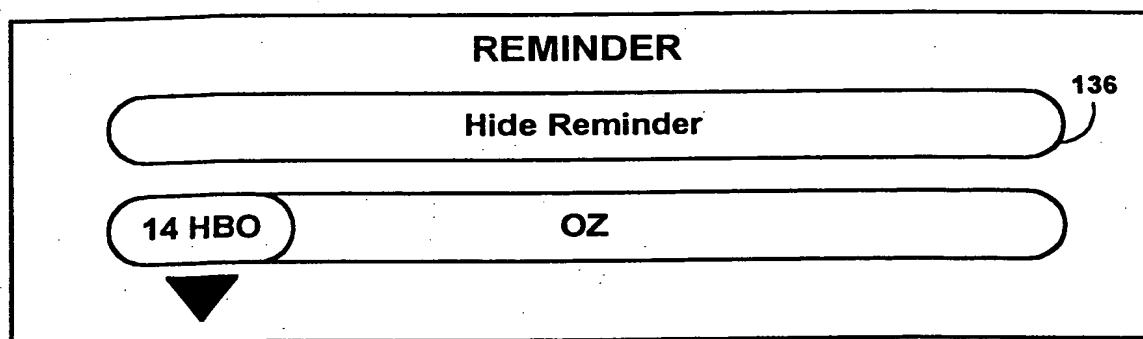
Message

E-mail ☒

132

FIG. 11

## Television Video



**FIG. 12**



DIGITAL  
CABLE



6:03PM

TV GUIDE

SELECTABLE  
ADVERTISEMENT

SELECTABLE  
ADVERTISEMENT

COMING SOON

PPV Movies

Special Events

Returning Series

New Series

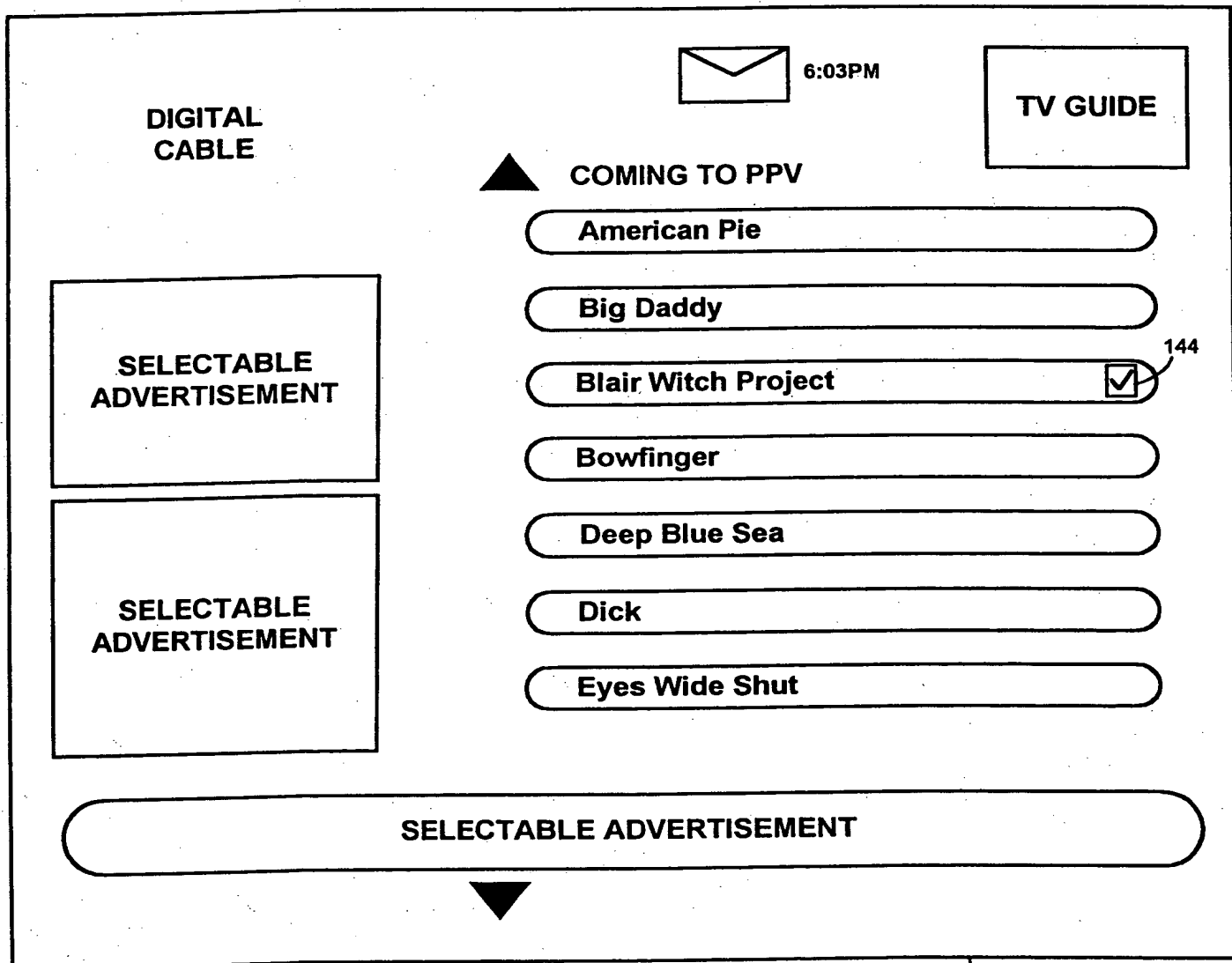
Coming to HBO

SELECTABLE ADVERTISEMENT

142

140

FIG. 13



138

FIG. 14

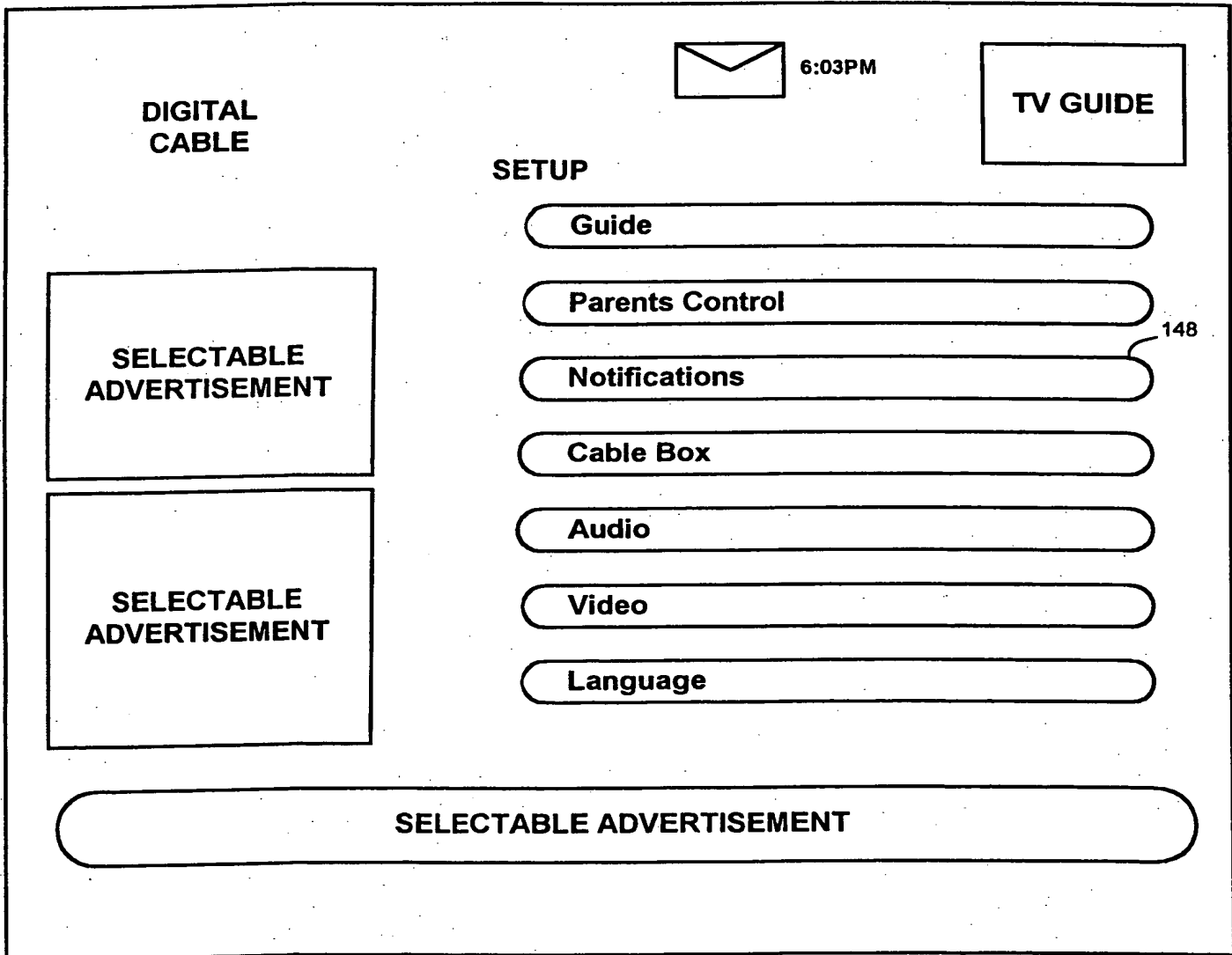


FIG. 15

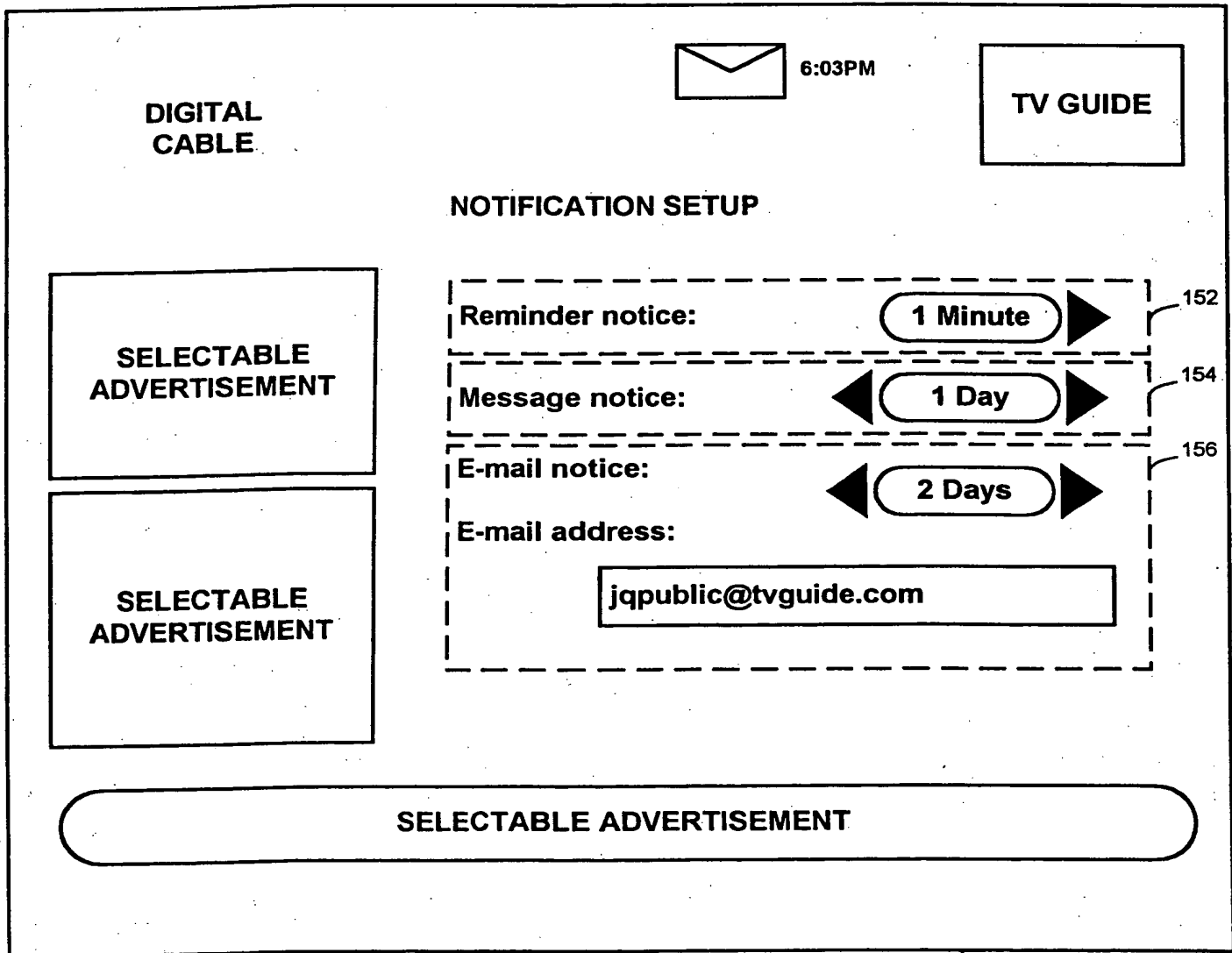


FIG. 16

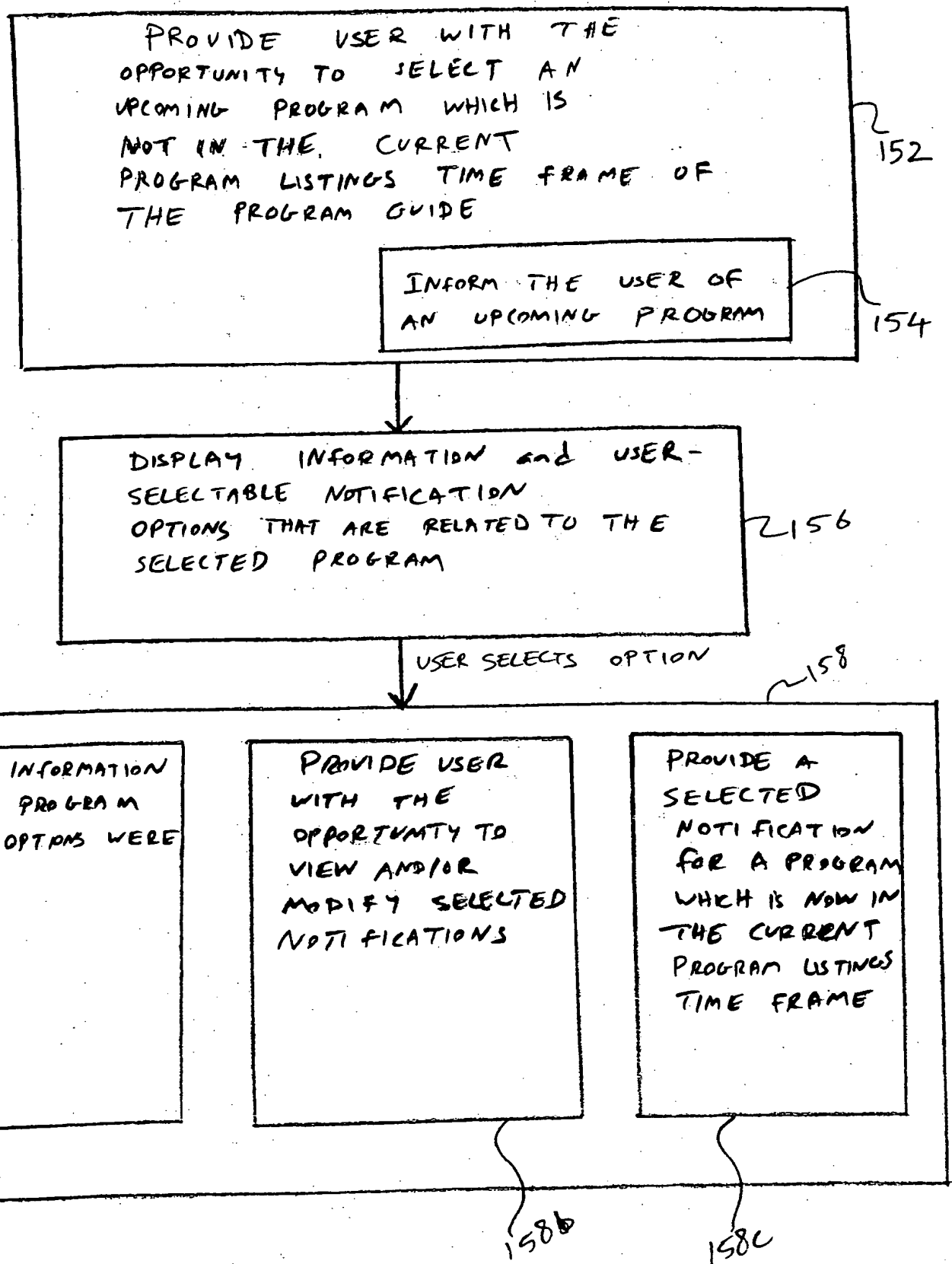
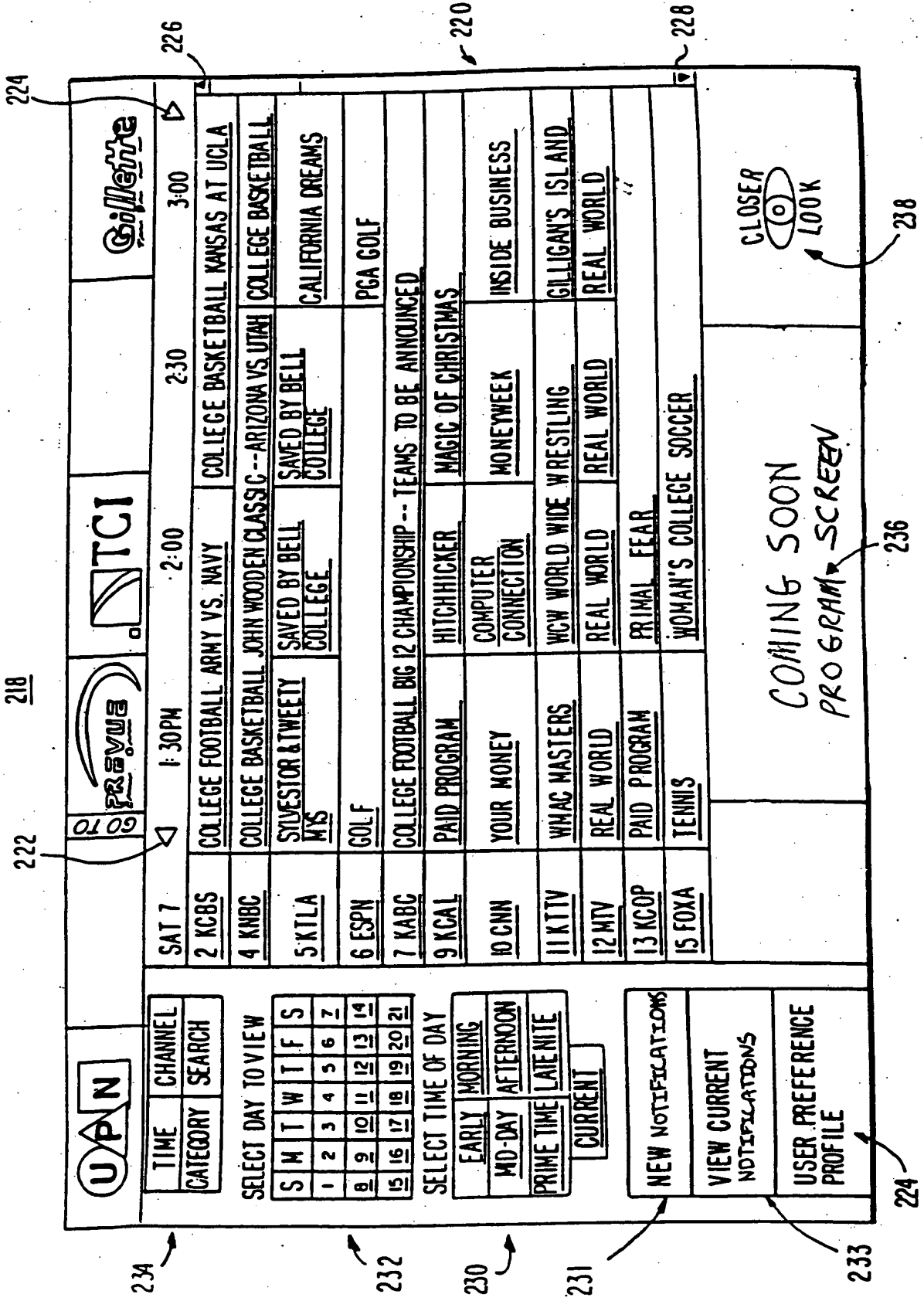


FIG. 17

FIG. 18A



310 FIG. 18B

COMING SOON PROGRAM SCREEN	
312	TITANIC
	THE GENERAL
	SAVING PRIVATE RYAN
	* RUSHMORE

UV-98

FIG. 19

410

413
424

ENTER NAME:

ENTER E-MAIL ADDRESS:

ADDRESS 2:

430

HOW SOON BEFORE EVENT DO YOU WANT TO BE NOTIFIED ?

440

☐ 1 HOUR  
☐ 1 DAY  
☐ 2 DAYS  
☐ OTHER

NOTIFY ME:

☐ ONCE ONLY.  
☐ EACH TIME BEING BROADCAST  
☐ EACH TIME THIS MONTH.  
☐ OTHER



FIG. 20

510

513

NOTIFY ME EACH TIME:

FROM: DATE: TIME: TO: DATE: TIME:

515

HOW SOON BEFORE EVENT DO YOU WANT TO BE NOTIFIED?

DAYS: HOURS: MINUTES:

517

ENTER

EXIT

519

FIG. 21

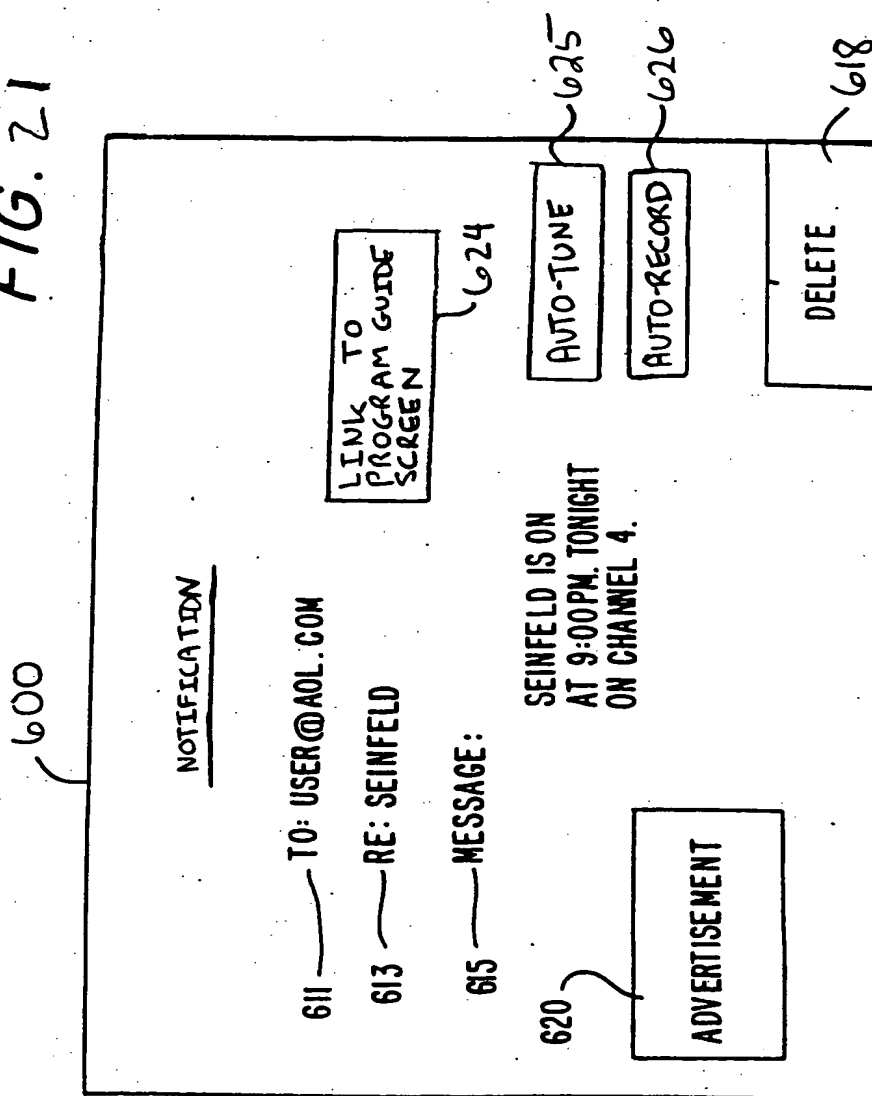


FIG. 22

710

CURRENT NOTIFICATIONS		
<u>PROGRAM</u>	<u>NOTIFY</u>	<u>SUBMITTED</u>
PRIMAL FEAR	<ul style="list-style-type: none"><li>• EACH TIME</li><li>• 1 HOUR BEFORE EACH BROADCAST</li></ul>	NOVEMBER 1, 1997 AT 3:03 PM
712		714
	CANCEL	EXIT

713

FIG. 23

810

NEW NOTIFICATIONS		
<div>ENTER NAME: <input type="text"/></div> <div>ENTER E-MAIL ADDRESS: <input type="text"/></div>		
<div>ENTER PROGRAM TITLE: <input type="text"/></div>		
<div>HOW SOON BEFORE EVENT?: <input type="radio"/> 1 HOUR    <input type="radio"/> 2 DAYS    <input type="radio"/> 1 DAY    <input type="radio"/> OTHER</div>		<div>NOTIFY ME: <input type="radio"/> THIS TIME ONLY    <input type="radio"/> EACH TIME THIS MONTH    <input type="radio"/> OTHER</div>
<div>SUBMIT</div>	<div>VIEW CURRENT NOTIFICATIONS</div>	<div>EXIT</div>

830

840

883

880

813

818

824

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# EXHIBIT H

DOCKET No.

UV-81

CONFIRMATION No.

9736

APPLICANTS

Joshua Rosenthal et al.

APPLICATION No.

09/262,658

FILED

March 4, 1999

RECEIPT IS HEREBY ACKNOWLEDGED OF THE

Transmittal Letter (in duplicate); Reply to Office Action; Formal Drawings (sheets 1-16);  
Check in the amount of \$1020.00 (3 mon. ext of time); Supplemental Information  
Disclosure Statement; PTO 1449 Form (in duplicate); Copies of 26 Foreign Patent  
Documents and copies of 2 U.S. Patent Applications; Check in the amount of \$180.00  
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January 13, 2005

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# EXHIBIT I

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION

Applicants : Joshua Rosenthal et al.  
Application No. : 09/262,658 Confirmation No. : 9736  
Filed : March 4, 1999  
For : PROGRAM GUIDE SYSTEM WITH USER  
DESIGNATED FAVORITE THEMES  
Group Art Unit : 2611  
Examiner : Jason P. Salce

Mail Stop Amendment  
Hon. Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

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# EXHIBIT J



EV 371748188 US



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Insurance <b>0.00</b>	Acceptance Clerk Initials <b>0065</b>	COD Fee
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Total Postage & Fees <b>0065</b>		

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Mo. Day		
Delivery Date <input type="checkbox"/>	Time <input type="checkbox"/> AM <input type="checkbox"/> PM	Employee Signature
Mo. Day		

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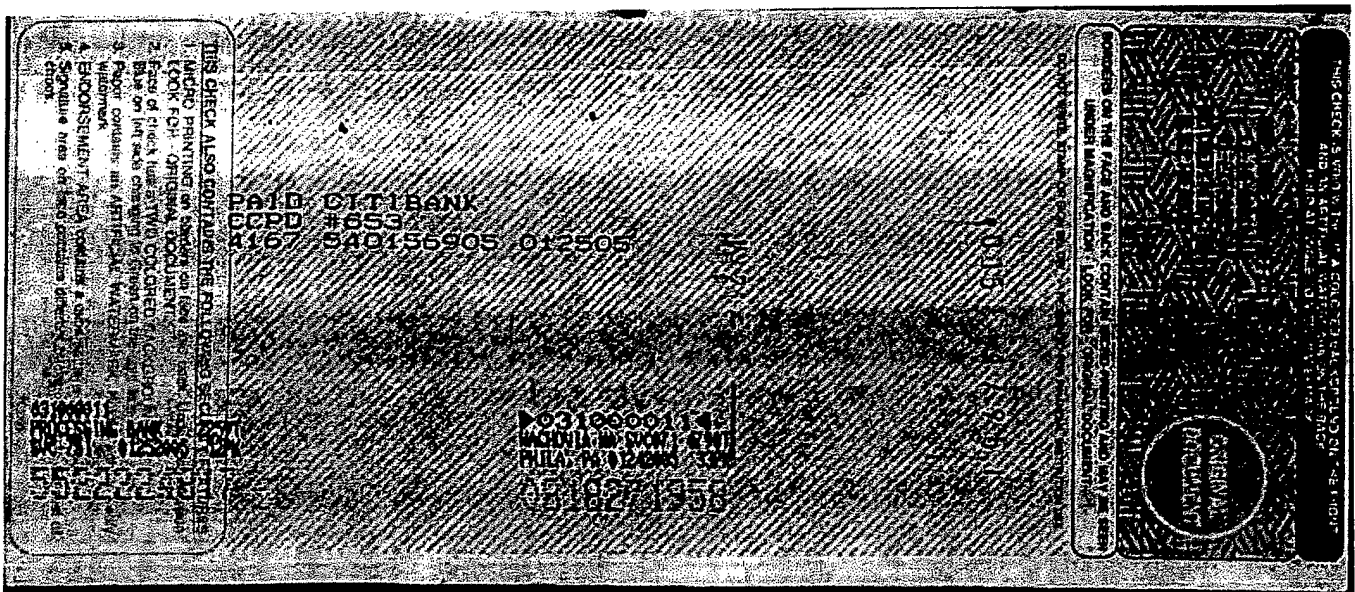
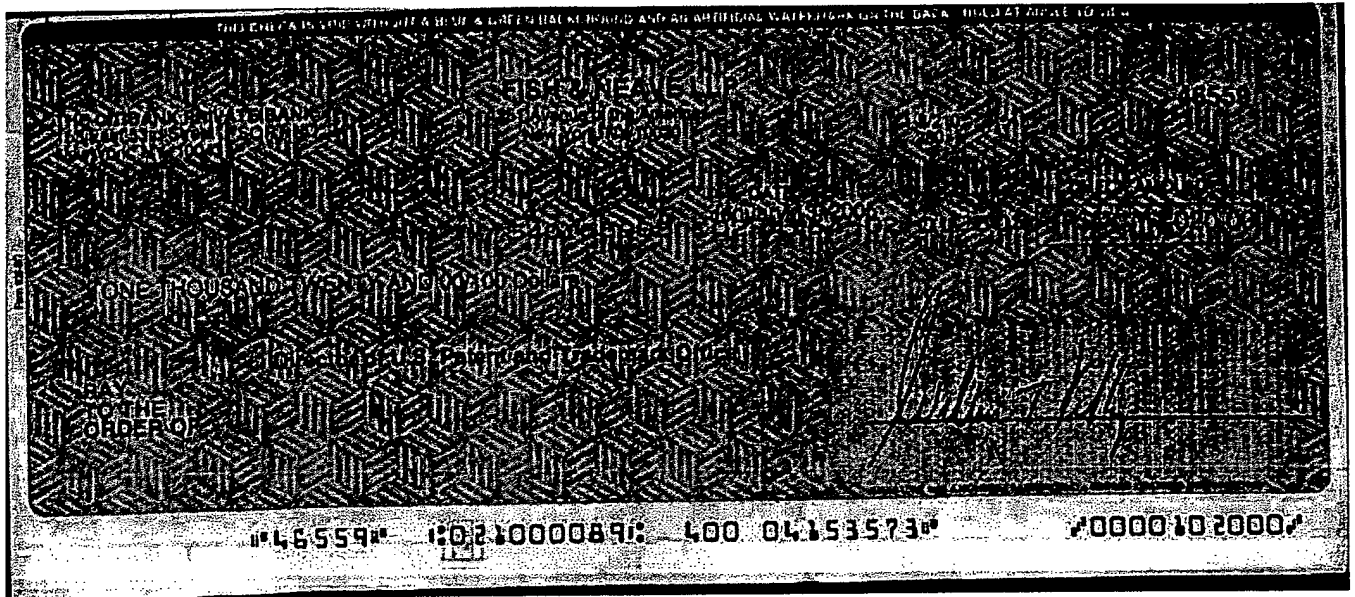
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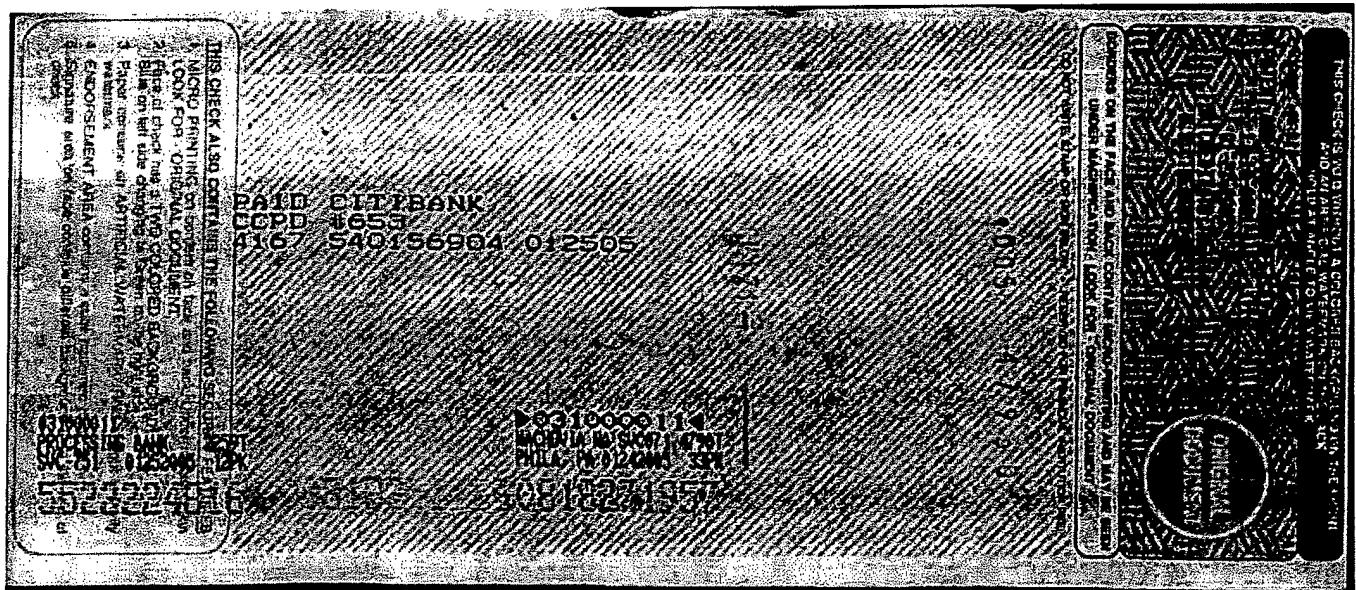
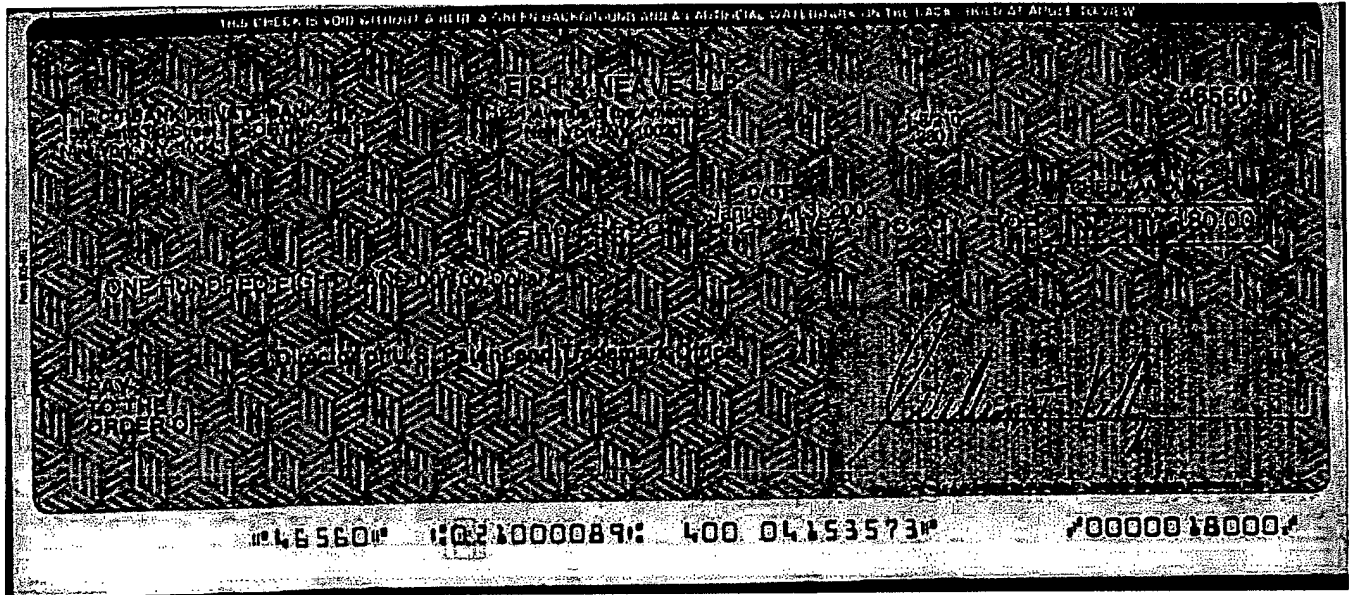
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# PATENT SPECIFICATION

(11) 1 554 411

1 554 411

(21) Application No. 33294/75 (22) Filed 9 Aug. 1975

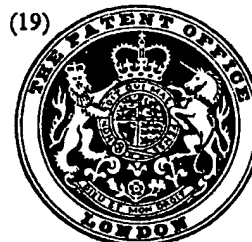
(23) Complete Specification filed 5 Aug. 1976

(44) Complete Specification published 17 Oct. 1979

(51) INT CL<sup>2</sup> H04B 3/54

(52) Index at acceptance

G4H 13D 13F 14A 14B 14D 1A 60 NC1 NC3 RBE RCE



## (54) IMPROVEMENTS IN OR RELATING TO CONTROL SYSTEMS

(71) We, COMMUNICATIONS PATENTS LIMITED, a British Company, of Carlton House, Lower Regent Street, London, SW1Y 4LS, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to control systems such as may be used in wired signal transmission systems for the remote control of a subscriber's TV signals from a control center.

Present cable TV systems generally transmit off air television broadcasts or other programs to subscribers who pay for the privilege of receiving the programs. Within this field, there has long been a need for a cost-effective method of controlling access to the cable system. At the present time, particularly in a dedicated system where taps for connecting subscribers to the system are installed during initial construction, a technician is sent to a subscriber location and utilizes a lift-truck while either connecting a subscriber's lead-in cable to a tap port, or disconnecting the subscriber's cable from the port. It is obvious that a method for providing such an action from a central office or control center would save considerable time and money, and also improve the flexibility of the system generally. A suitable remote control system would permit not only control of a subscriber's access to the system as a whole, but might also allow for partial access to the system on a time basis, an individual channel basis, or both. Thus, a subscriber might be permitted to view none, one, several or all of the available channels of programming. Furthermore, the subscriber might be permitted to view one or more specific channels only at specific times depending upon the terms of his subscription.

In addition to the advantages such a system can provide for the control of basic services, it would be of even greater advantage in the control of pay-TV services. For example, in some pay television systems contemplated by the present art, it is proposed that coin boxes or other receptacles suitable for receiving pay-

ment from a subscriber for viewing a particular television program be installed on the subscriber's television receiver. Upon deposit by the subscriber of required payment into the payment receptacle, a switch located adjacent the receptacle or television receiver would be actuated whereby viewing of the desired program would be permitted. In order for the sponsor of the pay TV service to collect its revenues it, too, would be required to dispatch an individual to the subscriber's location to empty the payment receptacle. Enterprising subscribers may, through the use of jumper wires, be able to bypass the payment receptacle in order to view the desired program without making the required payment. Bypass is also possible where purchased tickets or other buying means are needed to actuate the subscription channels.

It would be desirable to avoid these difficulties by permitting the system management to provide or deny pay-TV or special channel services on a remote control basis. Remote control of the provision of pay-TV service on one or more channels would also be desirable to permit a multilevel operation of these channels. As an example, it would be useful to provide that a channel dedicated to pay-TV could be sold at one level of programming (i.e., fee) in the morning, at a second level at midday, and a third level in the evening, and to allow the system operator at the program center to turn on or turn off subscribers who are buying or not buying that particular level of service. In addition access to individual programs could be controlled.

Still another remote control operation that is desirable, among others, is the remote energizing of a transponder device which may very well take signals from a store which serves as a memory for actions in the subscriber location, in a section of the cable system, in a nearby amplifier or in a host of other potential locations where remote status indication is of importance.

One approach to remote control of a subscriber location has been in essence to provide a duplicate of an RF paging system, requiring transmission of special control signals below

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300 khz transmitted in addition to programs and power, but with some switches in place of the conventional "beeper" or tone oscillator plus speaker. This is a complex system and extremely expensive to implement, particularly for use in an outdoor environment. The provision, installation and operation of the many required RF receivers makes this system fail to meet the need for a cost-effective remote control cable TV network.

It is an object of the present invention to provide a control system which obviates or mitigates the shortcoming of the prior art as described above.

According to the present invention, there is provided a control system responsive to a coding signal constituted by a succession of signal elements, each signal element being of one of two types, said system including an encoder providing alternating power having a succession of full cycles of either of two predetermined durations, each duration corresponding to and being representative of a respective one of said signal elements, whereby said power is encoded in accordance with said coding signal.

The present invention also provides an apparatus for selectively addressing and controlling in accordance with coding signals, one or more power-consuming control devices associated with each of a plurality of remote power-consuming terminals to achieve one or more desired control functions at each of the remote terminals, wherein said power-consuming terminals are supplied with power from a common power unit, each coding signal being representative of a desired control function to be effected at one particular remote terminal coupled to said power unit, wherein said power is alternating current, an encoder is associated with said power unit for causing individual cycles of said power to have either a first or a second duration in accordance with said coding signals, the encoded power being supplied to each remote terminal, and a decoder is provided at each remote terminal receiving said encoded power and deriving therefrom power for energising said decoder and said remote terminal control devices, said decoder also deriving from said encoded power the particular signal representative of the desired control function for the respective terminal and said control devices at said terminal being responsive only to said particular signal for performing said desired control function.

A coaxial cable, as used in cable TV systems generally has two separate bands of transmissions. One permits power to be carried in the system, to provide energy for trunk and distribution amplifiers along the system. The other band permits the transmission of the RF program signals. In conventional systems, separate portions of the system, such as indi-

vidual trunks or groups of subscriber stations, may be powered by respective power supply units, each energizing a section of the system allocated to a particular set of stations.

To utilize to the fullest extent the already existing systems, an embodiment of the present invention provides an arrangement by which special subscriber connection devices (taps) are provided, each for coupling a small number (e.g., four) of subscribers to the cable system. Each tap served from any one power supply unit is given an individual address code, and when properly addressed will actuate any one or more functions for the particular subscriber, such as connecting or disconnecting the subscriber from the cable or jamming his signal, either on an individual channel basis or completely, or even for a predetermined time interval. The same power supply unit will supply energy for controlling the various modes of subscriber access to the system as well as energy for other electrical devices serving the taps, such as repeater or distribution amplifiers.

To accomplish this, the required power produced at the power supply unit is coded or modulated in accordance with tap-address and control signals.

In order to have the multiplicity of power supply units provide this coded power flow, each power unit is also allocated a power unit address code, and the coding of its power for actuating the required taps is controlled from the central control point ("head end") in response to a modulated RF carrier upon which both the power unit address, the tap or subscriber address, and subscriber status information is encoded. As a further economy in the system, the RF carrier used may be a pilot-frequency carrier already utilized in the system, as for amplifier gain or level control purposes.

The RF carrier signal transmitted from the central station is serially modulated with data defining the desired control functions relevant to a subscriber and the address of the subscriber's tap and of the power supply unit serving the tap. The modulated RF carrier is transmitted to all of the power supply units in parallel. Each power supply unit generates power at a quiescent frequency while decoding the data transmitted on the received RF carrier. When the address contained in a particular data word matches that of the respective power supply unit, the power output of the power supply unit is coded in accordance with the subscriber tap address and instruction data of that word encoded on the RF carrier to further transmit or relay that data to all of the subscriber taps served by that power unit. The power transmissions received at all the subscriber taps are continuously decoded. When the tap address encoded on the power transmission corresponds to that

preset in a tap, the subscriber tap port control function apparatus for that tap is actuated in accordance with the information relayed through the power transmission. In effect, the system can be thought of as being powered by data which is arranged to control remote components in the system.

5 An embodiment of the invention will now be described, by way of example, with reference to the accompany drawings, in which like reference numerals are used to indicate like parts in the various views.

#### *Description of the Drawings:*

15 Fig. 1 is a basic block diagram showing the general flow of signals from the head end to the subscriber function control switches in a cable TV system according to the invention.

20 Fig. 1A is a system schematic block diagram of a preferred embodiment of the invention illustrating the components of the blocks of Fig. 1 and their interconnection in a multi-subscriber situation.

25 Fig. 2 is a block diagram showing examples of the various types of apparatus which can be used to transmit subscriber control information from the head end of a cable television system according to the invention.

30 Fig. 2A is a schematic diagram partly in block form of the head end encoder of the preferred embodiment of the invention.

Fig. 3 is a schematic diagram of a power inserter and RF tap for the power supply of the preferred embodiment of the invention.

35 Fig. 3A is a block diagram of a carrier receiver/detector for the preferred embodiment of the invention.

Fig. 4 is a block diagram of program circuits for modulating the power supply frequency with binary code data words.

40 Fig. 4A is a schematic diagram of the d.c. power supply section of a power supply unit for the preferred embodiment of the invention with the powered circuits shown in block form.

45 Fig. 4B is a schematic diagram partly in block form of a power switching circuit for the preferred embodiment of the invention providing AC power, frequency-modulated with binary coded signals.

50 Fig. 5 is a schematic diagram of the power supply section of a tap for the preferred embodiment of the invention.

55 Fig. 5A is a schematic diagram of a tap which may be used in the apparatus of the present invention.

Fig. 6 is a block circuit diagram of tap logic control circuits for receiving and decoding program control data.

60 Fig. 7 is a schematic diagram of a switch used to control access of a subscriber to basic service and pay service in the preferred embodiment of the invention.

Fig. 8 is a schematic diagram of a jamming oscillator.

#### *Description of the Preferred Embodiment:*

65 Referring now to Fig. 1, the control system is shown in general block diagram form to illustrate the manner of communicating control signals between a control center or head end 1 and a plurality of subscriber function control switches 40a-c through a wired network of cables 4 which will pass both low frequency power signals (in a range from 50 Hz to 50 khz for example) and high frequency program signals (such as radio and television programs in a range above 100 khz for example). The control signals in passing from control center 1 over cable 4 to one or more remote power supply units 2 may be carried as modulation on RF carrier frequencies. Each power supply unit is preferably a pre-existing unit for supplying necessary power, such as to repeater amplifiers, in the cable system, and adapted according to this invention to provide control signals for determining the functioning of the control switches 40a-c. This invention relates primarily to control signals, the path of program signals being conventional and within the province of those skilled in the art, as exemplified for example in U.S. Patents 3,423,521 and 3,922,482.

70 Simplified equipment is afforded by this invention over known type of addressable paging receivers and decoders operating with radio frequency and tone signals to select one of a plurality of stations for a transmission, where both transmitting and receiving circuits are of necessity complex. This simplification is accomplished by coding the power transmission from power supply units 2 with control codes to transmit commands to addressable tap units 3 over cable 42. A number of taps 3 may be serially connected along a single line if desired. Thus each control center can program a plurality of power supply units 2 and each power supply unit can in turn transmit commands to a plurality of addressable tap units 3, each tap unit serving one or more subscribers. Each tap 3 includes a decoder unit 35, the output of which determines the operation of switches 40a-c which control the functioning of a local program display apparatus 46 such as a television receiver.

75 Each power supply unit is controlled to provide under command of the control center 1 power of either 60 Hz or 120 Hz on output cables 42. The code for example can comprise a sequence of single cycle "0" or "1" bits. In each addressable tap 3, a 120 Hz cycle is decoded as a logical "0" and a 60 Hz cycle as a logical "1" to thereby provide a digital control signal at decoder 35. While it is preferable that the full cycles of encoded power representing the data bits have a frequency relation of 2 to 1, this may be modified

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to provide cycles of different frequencies, such as 3 to 1 or even non-integrally related, but with substantially different durations. Thus each subscriber may be addressed separately from a control center for controlling a plurality of selected functions at the subscriber station by operating those control switches 40a-c. Accordingly, complex RF and tone receivers and detectors are not required at the subscriber locations.

Fig. 1A illustrates a preferred embodiment of the invention, in the form of a cable TV system such as a CATV system, showing the principal components. The system comprises a central station or head end 1 from which TV signals originate and by which access to the TV system by all subscribers is controlled, and a plurality of controlled subscriber directional taps 3a to which the television receivers 46 of the system subscribers are connected, usually via tunable frequency converters 45. Each of a plurality of power supply units 2 provides power to RF signal amplifiers (e.g., 110) and to a number (typically up to 1024) of subscriber taps 3 for energization of the electrical and electronic components associated therewith, e.g., switches 40a-c, and control logic 135, forming part of decoder 35. Each subscriber tap 3 has associated with it one or more switching devices 40a-c, which permit appropriate TV signals transmitted by the cable TV broadcaster over the system to be received by the television receiver 48 of the subscriber. Certain switching devices may be used to isolate the receiver set 46 from the cable TV system completely, while others may be used to enable or disable specific TV programming channels where several programs are simultaneously transmitted on respective channels.

The same RF signal transmission from the head end is received by all of the system power supply units 2. Similarly, the coded power transmissions of a particular addressed power supply unit 2 are received simultaneously by all of the taps 3 which are served by that supply unit 2. As seen below, this permits the several power units to be addressed serially at a high rate (e.g., 20 kilobits per second) so as to be almost simultaneously addressed, while the various sets of taps 3 actuated from the respective power units may then be addressed simultaneously, in parallel, at a slow rate (e.g., about 60 to 120 bits per second). In the operation of the system, it will be understood that a signal need be sent out as to a particular subscriber station only when a change is desired in the access of that station to the cable system.

As can be seen in Fig. 1A, the head end or central station 1 comprises an RF television program signal source 102 having an output at which there are provided RF signals modulated with audio and video television informa-

tion for perception by a subscriber's standard TV receiver. Also included in the head end 1 is an RF signal generator 8 which can be a conventional pilot signal generator.

The generator 8 provides at its output a constant frequency RF carrier signal. In a preferred embodiment of the invention the nominal frequency of the RF carrier signal is 220 megahertz. However, the invention is not limited to use with carrier signals of this frequency and other frequencies may be used in the practice of the invention. The RF signal generator 8 may be the same signal generator used to provide a reference or pilot signal for controlling gain or level of amplifiers in the CATV cable provided that the system is one which is operable with an unmodulated pilot signal. If an unmodulated pilot signal generator is not available one can be added to the system in the manner known to those skilled in the art.

The output of the RF pilot signal generator (that is, illustratively the 220 megahertz signal) is applied to the input of an encoder 104 located at the head end 1. The encoder 104 modulates the RF signal from the generator 8 with subscriber control function information in a manner to be described and provides a modulated RF signal at its output. The RF signal modulated with such subscriber control function information and the RF television program signal from the source 102 can both be combined in a conventional summing circuit 105 and transmitted from the head end 1 on a common coaxial cable 4 to the power supply units 2.

Each of the system power supply units 2 comprises a power inserter 24 (shown in more detail in Fig. 3) which has an input 140 to receive the RF carrier signal modulated with subscriber control function data from encoder 104 and an output 146 for applying that modulated signal from encoder 104 to a carrier receiver/detector 25 (shown in more detail in Fig. 3A) which demodulates that carrier signal. In addition, the power inserter 24 has a second input 150 for receiving power from the output of a power switch 22 (shown in Fig. 4B) and a second output 147 for transmitting the received power from the power switch 22 and the RF TV signals along the cable portion 42 connecting the power supply 2 with a plurality of addressable subscriber taps 3.

The transmitted power from the power switch 22 is AC having a square wave form derived by switching the input to the power switch 22 between respective positive and negative output terminals of a DC power supply 106. The DC power supply 106 may be a standard source of alternating current such as of 50 or 60 Hz which is converted to DC at appropriate voltage levels, or can comprise one or more batteries to provide

the necessary direct voltages. In a preferred embodiment of the invention the positive and negative DC outputs of the power supply 106 between which the power switch 22 alternates are illustratively of the value of  $\pm 62$  volts respectively. The DC power supply 106 also has outputs through which the plus or minus direct voltages are applied to a power supply logic circuit 108.

The power supply logic circuit 108 includes digital circuitry for decoding the modulation indicative of subscriber address and control function information which is provided at the output of the detector 25 and for applying a control signal to the power switch 22 for correspondingly alternating the input of the power switch 22 between the positive and negative outputs of the DC power supply 106. At the output of the power switch 22 there are produced AC square waves which are frequency keyed or modulated with digital data according to the subscriber control function information originally modulated on the RF carrier from the generator 8 at the head end 1. The frequency keyed AC square waves have a variable cycle and carry data at one bit per cycle, that is, at a variable bit rate.

The frequency modulated AC square waves are applied to the input 150 of the power inserter 24 and are inserted through the output 147 of the power inserter 24 onto the cable portion 42 for transmission to the addressable subscriber taps 3. The power output of the power supply units 2 may be applied back along the cable portion 4 toward the head end 1 as well as forward toward the taps 3 along the cable portion 42. This may energize amplifiers and other equipment either between the head end 1 and power supply units 2 or between the power supply units 2 and their associated subscriber taps 3 with appropriate power. The power transmitted along the cable portions 4 and 42 may for example be utilized to drive repeater amplifiers 110 for amplifying the program signals being transmitted to the subscriber taps 3.

Each addressable subscriber tap 3 has a basic service module 112 having an input at which the RF program signals and power are received and an output through which the RF program signals and power are transmitted to the remaining addressable taps. The output of the basic service module 112 is also applied through switches 40a (one for each subscriber served by the tap 3, shown illustratively as four in number) to frequency converters 45, each connected to one subscriber's television receiver 46 of the set which is served by that particular addressable tap 3. The output of the basic service module 112 may contain all of the transmitted RF program signals, such as basic TV programs, pay-TV channel programs, and other special services.

In order to prevent unauthorized subscriber

access to particular channels (e.g., a pay-TV channel for which no subscription has been taken) jamming oscillators 116a and b may be connected through switches 40b and c respectively to the inputs of the frequency converters 45 associated with the respective television receivers 46 to be barred. Each of the jamming oscillators 116a,b provides at its output a signal the frequency of which is varied about a nominal center frequency nearly equal to the carrier frequency for one of the channels to be barred.

The frequency of the jamming oscillators is varied by means of a wobulator circuit, such as an oscillator with a frequency tuning element such as a varactor diode to which a varying voltage is applied. As the voltage applied to the varactor diode changes so does the frequency of the wobulator output. A variable-frequency jamming oscillator is preferable to a fixed frequency oscillator in that a fixed frequency jamming signal has been found to be only partially effective in denying non-subscribers access to the information on the pay channels which are to be provided only upon special subscription.

Complete service to a subscriber is enabled by closing the switch 40a linking the output of the basic service module to the tap output port 49 serving the subscriber's converter and by opening the switches 40b,c on the jamming oscillators which connect the outputs of the jamming oscillators 116a,b to that output tap port 49. Directional couplers (not shown) may be provided between the output of the basic service module and the output port 49 to prevent signals from re-entering the output of the basic service module, which might cause one subscriber to interfere with the reception of another subscriber due to the limited isolation available in the basic service module.

In a preferred embodiment of the invention a single addressable tap 3 serves four subscribers. In each subscriber tap there are three switches 40a, b, c associated with each of the respective four subscribers or a total of 12 switches connecting the four subscribers' television frequency converters 45 to the basic service module 112 and jamming oscillator modules 116a and b. The first (40a) of the three switches connects the subscriber's output port 49 with the basic service module 112. The remaining two switches 40b,c connect the subscriber's output port 49 with the jamming oscillators 116a and 116b respectively.

In addition to the 12 control function codes associated with the twelve switches 40a,b,c there are two further control codes each of which controls program reception for all four subscribers. These two control codes and reset devices control all the switches 40a-c of the basic service module and jamming oscillators. Specifically, one of these two codes sets all of the output latches in the tap logic circuitry

(to be later described in conjunction with Fig. 6) to a logical value of "1" and the other code resets the latches to "0".

A DC power supply 120 for the tap 3 receives at its input from the power supply unit 2 the AC square wave power frequency-modulated with subscriber control function information. The tap power supply 120 provides at its outputs 120a and 120b DC power for energizing the jamming oscillators 116a,b and a tap logic circuit 35. The incoming power flow and program signals are routed via lead 110a through the basic service module 112 and is interrupted if the basic service module 112 is removed.

The frequency-modulated square wave signals from the power supply unit 2 received in the tap power supply 120 are also supplied by lead 120c to a data output of the power supply 120. This data output of the power supply 120 is connected to an RC filter the output of which is applied to the data input 35a of the tap logic circuit 135. The data encoded on the AC square wave power is decoded in the tap logic circuit 35, and the decoded data is converted into signals which are applied from outputs 35b of the tap logic 35 to the control inputs of function switches 40a-c to regulate subscriber access to the programs of the system.

At the head end 1, a bit stream comprising a data word is formulated for each individual system subscriber. The data word includes information identifying the subscriber's unique tap address, his system access control functions and a power supply address which uniquely corresponds to the power supply unit that energizes the subscriber tap which is to be controlled. All the complete data words are sent out in sequence, and simultaneously to all the power supply units 2. Only those data words received at a given power supply unit 2 which contain address information corresponding to the address of that power supply are used to modulate the power output from that power supply unit 2. Data words which are not intended for that power supply unit and its associated taps are ignored, and have no effect upon the output of that power supply unit. Each subscriber tap thus responds only to data words contained in the power supplied to it from its own power supply unit. This reduces the amount of address decoding necessary in each tap and the time to communicate with all the taps in the system. When one power supply unit is communicating with a tap, a second power supply unit can be addressed so that it will concurrently communicate with a tap in its section.

As shown schematically in Fig. 2, the head end of the system generally includes an RF pilot generator 8 the output of which is of constant frequency and amplitude. The RF

pilot generator may be conventional in design, and any suitable carrier frequency may be used, a frequency of 220 MHz being employed in a preferred embodiment of the invention. This signal may now perform two functions, namely, the usual pilot-frequency function (e.g., for gain level control of repeater amplifiers) and as a carrier for the subscriber control function information.

The output of the RF pilot generator 8 is applied to an RF switch 9 which when closed permits transmission of the RF carrier to a cable 19 and which when opened cuts off RF carrier transmission to cable 19. Thus by opening and closing the RF switch, pulses of RF carrier transmission may be produced with the width of the pulses depending upon the duration of the closing of the RF switch. The switch thus serves as a modulator for the pilot frequency signal. By assigning two possible widths to each pulse produced by RF modulator switch 9, each pulse may contain one bit of information. For example a wide pulse may signify a binary 1 while a narrow pulse signifies a binary 0.

The 25-bit data words are serially encoded on the RF carrier by the use of pulse duration amplitude modulation (PDM), as described. While other modulation schemes may be used, and this invention is not limited to the particular modulation scheme employed in the preferred embodiment, PDM has been found desirable in that the data is self-clocking, obviating any requirement for complicated bit synchronization, and because standard pilot carrier transmitters and receivers may be easily adapted to the application herein described. In view of the number of bits that must be received by a tap to select and control the subscriber access, as will subsequently be described, a data rate from the head end of 20 kilobits per second has been found useful.

The opening and closing of the RF switch is accomplished in response to the output of an output module 41 which may receive data representing the identities of each of the subscribers and the latest control function status assignable to each of the subscribers. As discussed more in detail below, this data may be derived from a mini-computer 11, a keyboard and display 12, or a recorder such as a paper or cassette tape unit 13. Subscriber control data may be manually inserted into the system by an operator by means of a manual control box 10 operatively connected to the RF switch for opening and closing the RF switch according to the entered subscriber data.

A 25-bit word has been found suitable for transmitting access information for each subscriber of a moderately large size cable TV system. Two of the 25 bits are used to signify the start and stop of each data word, respec-

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tively. Seven bits are used to identify the address of the power supply unit serving the subscriber tap which is to be controlled by the data word. This permits communication with up to 128 (2<sup>7</sup>) power units. Ten bits are used to identify the subscriber tap address to be controlled. The use of a ten-bit tap address permits communication with up to 1,024 four-subscriber taps for each of the power units in the system or up to 4,096 subscribers per power unit. Five bits of information are designated for defining the desired control function for the individual subscriber whose access to the system is being determined. The five-bit control segment of the data word can control, for example, up to 16 two-state control functions, e.g., two-position switches. This will provide 4 functions for each of the four subscribers. One bit is provided for a parity check of the transmission links. Using one RF pilot frequency, therefore, up to 524,288 subscribers can be controlled. By adding more frequencies, this number can be increased.

In the manual control mode shown in Fig. 2, utilizing control box 10, the control signals serially applied to the input of the RF switch 9 can come from a plurality of encoded switches. Electronic logic decoders provide the 25 bits of information to be transmitted. In such a manual system, a customer "address" book is referenced by an operator who sets the switches to indicate the bits of information which are to be transmitted. A "transmit" button (not shown) may then be pressed, at which time the control box 10 will automatically serially transfer the entered data to the amplitude modulator 9 to encode the RF carrier signal with the desired subscriber address and control data.

In a more sophisticated system, less prone to operational errors, a mini-computer 11 and keyboard with a small display 12 are provided. The subscriber "addresses" (for power unit and tap) can now be easily entered in decimal notation. With a teletype machine, or other printer (not shown), a printed record of all entries may be maintained, as well as a permanent paper or magnetic tape, if desired, for future automatic updating or control of the network. Another system option incorporates a dual magnetic cassette or cartridge storage and thermal printing machine 13. One cassette or cartridge can contain the customer addresses (in any order desired), and another a record of entries for the day (week or month). For a reasonably sized system, several cassettes or cartridges will be required to hold all of the customer addresses.

Updated address tapes can be made, by the same mini-computer (from the entry record tape and the keyboard) during off hours. A large tape unit, e.g., a reel-to-reel recorder employing magnetic tape may be used to hold

all customer data on a single tape.

A further optional refinement to the system includes a large disc memory 14, a real time clock 15, and a high speed line or form printer 16. All of the customer's data may now be in the disc memory, such as name, address, financial record, tap and power unit addresses, and program(s) desired, etc. This system can automatically maintain billing status; generate invoices and internal program usage printouts; automatically turn on and off the desired programs for customers; and automatically update the entire system (at night) to catch up with low priority updates and correct any noise-induced errors. If a two-way trunk is in use, the return data may include status information from the power units on signal levels, quality, etc., as well as customer data, all of which may be monitored by the computer.

In a preferred embodiment of the invention, keyboard and display 12 is used to enter the data for subscriber addressing and function control in decimal form. Referring now to Fig. 2A, the data is manually entered in decimal form by means of a conventional keyboard 122 operatively connected to a conventional storage register 124. A commonly available electronic desk calculator may be used to provide the keyboard storage register and display operatively interfaced to the output module 41. Digits punched on the keyboard 122 are individually stored in the register 124 for display on an indicator (not shown) of the type commonly found on electronic calculators (e.g., light-emitting diodes or gas discharge numeric indicators). The output of the storage register 124 is connected to an interface module 126 which includes a conventional 7-segment to binary-coded-decimal (BCD) converter 128. The output of the converter 128 is connected to eight individual conventional parallel/serial registers 130a-h, the first 130a of which holds 5 bits of information and the remaining ones 130b-h each capable of storing up to four bits of information, that is, each having four bit positions. The individual parallel/serial registers 130a-h are connected to form a single par./ser. register capable of storing 25 bits of information, that is, having 25-bit positions, in a conventional manner known to those skilled in the art, and may be replaced by a single 25-bit register. The data output of the par./ser. register 130a-h is then applied to the RF amplitude modulator 9 which correspondingly amplitude modulates the RF carrier signal from the RF signal generator 8, as described.

A 25-bit data word for coding on the RF carrier signal is stored in the parallel/serial registers 130a-h as follows. A stop bit is automatically entered into the first bit position of the par./ser. register 130a. The second bit

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position of the register 130a holds a parity bit the provision and purpose of which will later be described. The remaining three bit positions of the first par./ser. register 130a hold the first three bits of the power unit address of the binary-coded data word. The second register 130b holds the remaining four bits of the power unit address. The 10-bit tap address is stored in par./ser. registers 130c-e. Register 130f holds a 2-bit control function identifier word segment and register 130g holds two bits for individual subscriber selection. Register 130h holds one bit indicating the desired state (on or off) of the selected control function switch and an automatically entered start bit.

The power unit address, tap address, subscriber address, and 3-bit control function information are thus entered in decimal notation via the keyboard 122 into the storage register 124. The data is then transferred from the register 124 through a 7-segment to BCD converter 128, where each digit is converted to binary form, and then placed into the parallel/serial registers 130a-h. As is conventional in the desk calculator 11, the data stored in the storage register 124 is sequentially strobed, that is, demultiplexed, since only one digit may be read out of the register 124 at a given time. To distribute the data among the registers 130a-h the digit select strobe signals are used to demultiplex the stored digits from the register 124 for loading the eight registers 130a-h. Eight wires are provided leading from the strobe output of the calculator 11 to the eight respective parallel/serial register load control inputs. A strobe signal appears on each of the 8 wires in sequence permitting the selected register to which the wire is connected to accept the data output of the converter 128 which is a binary representation of the decimal digit stored in the selected position of the storage register 124. A BCD representation of the 22 bits of information representing the power unit address, the tap address and the control function data is thus stored in the registers 130a-h.

The stop and start bits of "0" logical value generated in the interface module 126 are added as part of the data transfer sequence. Also included in the interface module 126 is a conventional parity tree which may be in the form of two modulo-two adders. Each functional output of the registers 130a-h is connected to an input of the parity tree 134 to count the number of "ones" in the data word. If the total number of "ones" is an odd number, a "0" is stored in the parity bit position in the register 130a. If the total number of "ones" is even, a "1" is stored in the parity bit position of the register 130a. In this manner the parity of the complete 25-bit data word stored in the parallel/serial registers 130a-h is always odd. Maintenance of odd parity is used to permit a check on the validity of the data received at the cable TV system power units 2. Any interference with the RF signal which changes any data bit will change the parity of the transmitted word from odd to even thereby indicating invalidity of the data received at the power units 2.

A 20 kHz clock 136 has its output connected through a gate to the clock input of the parallel/serial registers 130a-h. During transmission, the clock serially shifts the parallel-stored data out of the registers 130a-h to the modulator 9 for varying the amplitude of the RF carrier from the generator 8 at a 20 kilobits per second rate.

In modulating the amplitude of the RF carrier to create pulses of the carrier signal at the output of the amplitude modulator 9, wide pulses (preferably greater than 25 microseconds where a 25 microsecond clock pulse is used at the decoder) are employed to indicate a logical "1" and narrow pulses (less than 25 microseconds) are employed to indicate a logical "0". Pulse widths of 31 microseconds and 19 microseconds have been found satisfactory for the wide and narrow pulses respectively when a 25 microsecond clock pulse is used at the decoder. Other pulse durations may, however, be used within the scope of the invention.

In addition to serially encoding the 25 bits of address and control information onto the carrier signal from the generator 8, the modulator 9 is caused to encode an additional 25 bits of information all with logical value "1" on the carrier following each 25-bit coded data word. Thus for each data word 50 bits are transmitted over the cable 4 to the power inserter 24 of each of the power units 2 in the cable system. Since the start and stop bits are of logical "0" value the possibility of transmitting 25 consecutive bits other than the intended binary-coded control word with first and last bits having zero value is effectively precluded. All data words intended to be transmitted have 23 consecutive bits bounded at both ends by "0" bits, and the power units are made to respond only to such data words as will later be explained, thereby effectively precluding false responses.

The pulse-duration amplitude-modulated carrier signal containing the subscriber access control information from modulator 9 is combined in a summing circuit 105 with the program signals from the RF program signal source 102 and the composite signal is transmitted to all of the system power units 2. The input 140 of the power inserter 24, shown in schematic form in Fig. 3, receives all coded RF carrier signals transmitted from the head end 1 on the cable 4. These signals are coupled by the resistor 142 and capacitor

144 to the first (data) output 146 of the power inserter 24 to the RF carrier receiver/detector 25 (Fig. 1A). The program signals received at the input 140 of the power inserter 24 are also permitted to pass through the power inserter, to output 147 with low frequency components removed by a blocking capacitor 148, to the subscriber taps 3 served by the power unit. The program signals are thus permitted to pass directly through the power inserter 24 to the subscriber taps.

The direction of the power is controlled by conducting links 152 and 154. As shown in Fig. 3, power supplied at input 150 from power switch 22 (Fig. 1A) may travel in both directions from the power inserter 24, that is, both toward the head end 1 and away from the head end 1, e.g., toward the subscriber taps 3. Removal of link 152 prevents power flow from the power inserter toward the head end 1. Similarly, removal of link 154 prevents the flow of power away from the head end 1 or toward the taps 3. Grounded capacitors 156 and 158 equalize the frequency response of the signals transmitted through the power inserter. Respective LR chokes 166 and 168 remove undesired high frequency components from the power received at the input 150 and transmitted back toward the head end 1 or forward toward the taps 3. Capacitors 160, 162 and 164 also remove high frequencies from the power.

Referring additionally to Fig. 3A, the RF signals flow from the output 146 of the power inserter to the input of a conventional impedance-matching circuit 170 in the RF carrier receiver/detector 25. The output of the impedance matching circuit 170 is connected to the input of a first RF amplifier 172. The signal is amplified in the RF amplifier 172 and then filtered in the filter 174. There is further amplification and filtering in the amplifier 176 and filter 178. The signal is again amplified in the RF amplifier 180 and then applied to a detector circuit 182, where the envelope of the RF carrier signal containing the address and control information is detected.

The detected AM signal is amplified in a DC amplifier 184 and then applied to an RC filter 186 to remove any remaining RF carrier signal. The output of the RC filter 186 is connected to the input of a level shifting buffer 188 whose output signal control data is applied to a decoder 6 in the power supply logic circuit 108 (see Fig. 4) for decoding and data conversion and to a clock pulse generating monostable multivibrator (one-shot) 172 for operating the decoder 6 and a 25-bit shift register 174.

The data is serially received by the shift register 174 in the order it appeared in the parallel/serial registers 130a-h at the head end. That is, the bit in the first position of

register 174 is the stop bit, the next bit is the parity bit, the next 7 bits represent the power unit address, the following 10 bits indicate the tap address, the next 4 bits identify the individual subscriber's function control switch to be operated, the following bit determines the state of the function control switch to be operated, and the last bit is the start bit. As will be recalled, the stop and start bits are "0".

The positive-going edge of each input data bit signal at the output of the buffer 188 triggers a monostable multivibrator 172 to provide a 25 microsecond pulse, that is, 1/2 of the clock period of the input data for a 20 kbps bit rate. Each clock pulse loads the data and shifts the contents of shift register 174. The decoder 6 is responsive to a long pulse data bit ("1") and short pulse data bit ("0"). The start bit and stop bit are used to identify that a word has been entered into the register 174, as detected from the outputs of the respective inverter buffers 180 and 182 being "1"s.

A conventional parity tree 178 (which can be a modulo-two adder) determines the parity of the received data word. The output of the parity tree 178 is high when parity is odd and low when parity is even. The first and last bit outputs of the shift register 174 are connected to respective inverter amplifiers 180 and 182. If the stop and start bits are "0" (or low) the outputs of the inverters 180 and 182 will be "1" (or high). A 7-bit comparator 176 is enabled by the clock pulse at lead 441 and receives the first 7 bits from register 174. The other comparator inputs are connected to a 7 pole, double throw switch, preset during installation of the power unit 2. The outputs of the 7-bit comparator 176, parity tree 178, and the inverters 180 and 182 are applied to four respective inputs of an AND gate 184. It will be recalled that each 25-bit data word is separated from an adjoining word by 26 "1"s and that the start and stop bits will only have "0" value when the complete received data word occupies its proper position in the 25-bit shift register.

Only when all of the inputs to the AND gate 184 are high is the output of the AND gate 184 high. A high output signal from the AND gate 184 enables an 18-bit parallel/serial register 186 to receive 15 bits of data from the 25-bit shift register 174. Specifically, the data stored in the 10th through 24th bit positions of the 25 bit shift register 174 is transferred to the 3rd through 17th bit positions of the 18 bit parallel/serial register 186 in conventional manner. The number of "1"s in the transferred 15 bits is counted in a parity generator 188 by which a "1" or "0" is placed in the second bit position in the 18 bit shift register 186 as required to make the parity of the word stored in the 18-



bit shift register 186 even. Start and stop bits of logical value "0" are automatically inserted in the last and first bit positions in the 18-bit shift register 186.

5 The continuous data readout from parallel/serial register 186 is caused to operate power switch 22 by way of lead 451. As each bit is read out it enables formation of the next clock pulse transmitted through lead 452. The readout is synchronized by 120 Hz clock oscillator 192, which free runs unless synchro-

10 nized from the power line input lead 454. Clock pulses at 120 Hz are on line 455, inverted pulses on line 458.

15 The parallel/serial register 186 output bits respectively provide one full cycle of either 120 Hz (where the shorter pulse is binary "0") or 60 Hz (where the longer pulse is binary "1") at the output of NAND

20 gate 459, and each positive clock edge on line 452 shifts parallel/serial register 186 to the next stored bit. Thereafter "1" bits are continuously generated by shift register 186 to thereby produce an output normal 60 Hz transmission at data line 451 in the absence

25 of presentation of further data words. That is, a single coded word is read through whenever the power unit is addressed and otherwise the power supply is uniformly 60 Hz. The constant condition is simply met by

30 holding voltages on lines 460 and 470 constant without transition. Thus the nature of the signal output of parallel/serial register 186 is a DC level changing when data goes

35 from "0" to "1" and vice versa, generally known in the art as a non-return-to-zero type signal.

The parallel/serial register data is taken bit by bit from line 460 and the presence of a "1" polarity signal will gate AND circuit 461 for 60 Hz oscillations from counter 456 and lead 457, which then pass through enable gate 461 and then to the OR circuit 462 and the polarity inverter 501 to output

40 NAND gate 459. The opposite polarity "0" signal by way of inversion at the input buffer 502 will gate AND circuit 463 to thereby gate the 120 Hz oscillations on line 455 to the output NAND gate 459.

50 It is necessary however to remove all DC levels from the system power and to have proper phase synchronization at the end of a "0" cycle and the start of a "1" cycle or vice versa. Since the period of the 60 Hz square wave is twice that of the 120 Hz square wave, the beginning of a cycle of the first 60 Hz square wave will not always coincide with the end of a 120 Hz cycle. Therefore, there may be times when a "1" is to be transmitted

55 following the transmission of a "0" at which time the 60 Hz signal will be in the middle of a cycle, that is, crossing from positive to negative. At these times the inverse of the 60 Hz signal will be at the beginning of a

cycle and hence a cycle of the inverse signal is desirably selected for application to the AND gate 461. In this fashion a complete 60 Hz cycle of the proper polarity is always available for application at the output of the NAND gate 459 whenever a "1" is detected

65 and similarly a 120 hertz cycle is always available whenever a "0" is detected. Thus, the 60 Hz and 120 Hz cycles all have the same polarity.

The output of the 120 Hz clock oscillator 192 is applied to flip-flops 465 and 468. The 120 Hz clock signal is also applied to inverter 505. The 120 Hz output of inverter 505 is connected to the clock input of a divide-by-2 counter 465 and also to the input of the AND gate 463. The appropriate 60 Hz signal from the counter 456 is applied to the gate 461 depending on the output of an AND gate 507 which is applied to the reset input of the counter 456. The output of the AND gate 507 is high whenever a "0" from the register 186 is followed by a "1". A "0" from the register 186 is inverted in a NAND gate 509. The output of the NAND gate 509 enables the flip-flop 465 to provide a "1" at its output to the AND gate 507. The output of the AND gate 507, however, remains low due to the action of the inverter 511. If the next bit out of the shift register 186 is a "1" the output of NAND gate 509 goes to a "0" and is reinverted in the inverter 511 to a "1" or high signal applied to the previously low input of the AND gate 507. The result is a high signal at the output of the AND gate 507 which resets the counter 456 so that the next 60 hz alternating squarewave is initiated in proper phase. The output of flip-flop 468 is caused to go to a "0" when a capacitor 513 coupled positive transition occurs at the output of the OR gate 462, causing the output of the NAND gate 459 to remain at a "0" until the next positive edge of the 120 Hz clock 455, thus removing any transients from the output of NAND gate 459.

The circuit of Fig. 4 thus converts the data signals into coded power transmission, with intermixed full cycles of 60 Hz and 120 Hz frequency, each 120 Hz cycle representing a binary "0" and each 60 Hz cycle representing either a binary "1" or an uncoded period of power flow.

Referring now to Fig. 4A the output of the power unit logic 108 (see Fig. 1A) is applied to a control input 194 of the power switch 22. The power switch 22 has power inputs connected to plus and minus direct voltage sources (of preferably  $\pm 62$  volts) respectively, provided by the power supply 106. A power transformer 196, preferably of the saturating type to prevent over-voltage, is used in the power supply 106 with a center tapped secondary for providing  $\pm$  DC power by way of full-wave rectifier 198 and

capacitor filters 200 and 202. The power transformer 196 also provides squared output wave forms for synchronization. To compensate for input under-voltage, batteries 204 and 206 may be connected via diodes 208 and 210 to the DC lines 212 and 214. The batteries 204 and 206 are preferably trickle-charged through resistors 216 and 218. Fuses and circuit breakers (not shown) are preferably used in a conventional manner.

The power switch 22 switches either +62 volts or -62 volts to its output by means of a transistor switching circuit. Preferably there is a limit imposed on the slew rate  $dv/dt$  to prevent harmonics and amplifier power supply problems. One such circuit configuration is shown in Fig. 4B.

Referring to Fig. 4B a conventional polarity detector 271 produces the positive drive to transistor switch 272 and the negative drive to transistor switch 273 thereby providing an AC signal wave power output from the power switch 22. Amplifiers 274a,b drive respective optical isolation 275 a,b or equivalent voltage level changers for operating respective driver amplifiers 276a,b for causing switching of the transistor switches 272a,b. The optical isolators 275a,b each include a light source responsive to the respective outputs of amplifiers 274a,b and a light sensor having a voltage output which is a function of the intensity of the light from the source. The optical isolators 275a,b electrically isolate the signal input section of the power switch 22 (polarity detector 271 and amplifiers 274a,b) from the power switching output section. A current-limit control device 220 is desirable for protecting the output transistors 272 and 273. The outputs of the transistors 272 and 273 are applied to respective snubber circuits each of which includes a diode 222a,b in parallel with a series combination of a capacitor 224a,b and resistor 226a,b. The snubber circuits prevent the positive direct voltage output from going over the positive DC supply voltage and the negative direct voltage output from going under the negative DC supply voltage and neutralize the inductive effects of the load, i.e., the system's cables.

In operation the power switch 22 senses at its input the polarity of the low level signal output pulses from the power logic 108 which is a series of squarewave pulses, each cycle of which has a frequency of 60 hertz when it represents a "1" and 120 hertz when it represents a "0" and in response produces power pulses of frequency and polarity similar to those of the low level input pulses (60 or 120 Hz).

The decoded power output signals of the power switch 22 are applied to the input 150 of the power inserter 24 (Fig. 3) as hereinbefore described and are then transmitted

along the cable portion 42 toward the taps 3 and/or back to the head end 1 depending on the configuration of links 152 and 154. At each addressable tap 3 (Fig. 1A) powered by the power unit 2, the coded power output of the power unit 2 and the accompanying RF program signals are received at the power supply 120 disposed in the tap 3.

Referring now to Fig. 5 there is shown a schematic diagram of the tap power supply 120. The signals received at the tap input 228 are filtered in LC filters 230 and 232 to remove the high frequency program transmissions, leaving only the coded power to be applied to the primary winding of a power transformer 234. The secondary of the power transformer 234 has a grounded center tap. Pick-off points are provided on the secondary winding of the transformer 234 for applying the AC secondary signals to a full-wave bridge rectifier 236, to rectifier diodes 238 and 240 and to an input of the jamming oscillators 116a,b. Input regulation to the full-wave rectifier 236 is provided by oppositely polarized series connected zener diodes 242 and by the saturating core design of the transformer.

The output of the full wave rectifier 236 is filtered in capacitor 244. Zener diode 246 provides a regulator -15 volt direct voltage output of the rectifier diode 238. A capacitor filter network including capacitors 248, 249, 250, 251, 252 and 253 filters the positive and negative outputs of the full-wave rectifier 236 to provide DC outputs of  $\pm 4.2$  volts respectively. A negative 14 volts DC is provided at the output of the diode 240. The direct voltages of  $\pm 4.2$  volts, -15 volts and -14 volts are used to power the tap circuitry including the tap logic 35 and jamming oscillators 116a,b.

The data-coded power signal is taken from the secondary winding of the transformer 234 and filtered in an RC network comprising a resistor 260 and capacitor 262. The filtered data signal is then applied to a data input of the tap logic circuit 35 (Fig. 1A).

The previously described power supply of Fig. 5 is only one of several types that may be used. Fig. 5A illustrates in schematic form a tap circuit including another power supply configuration for powering one type of tap logic circuit, basic service module and a controlled-channel module connected to a filter trap. In the circuit of Fig. 5A the cable 42 is tapped at transformer 677 to obtain the television program signals and at line 678 to obtain the coded AC power transmission from the power unit 2. The coded power is applied to an LC filter to remove high frequency components and then to the primary winding of the tap power supply transformer. The coded power is then applied to the tap logic circuit 35 which controls an RF switch 690

for allowing or preventing the application of the television signals to subscriber stations. A filter trap 692 filters out a specific channel of television program signals for which no subscription has been taken.

5 A diode switch 697 in parallel with the filter trap 692 can be closed in response to a signal from the logic 35 to short circuit the filter 692 for permitting access by a subscriber to the television programs on the channel.

10 A more detailed description of a different tap 3 which contains variable frequency (wobulated) oscillators to selectively jam one or more channels of television programming which are to be denied to a subscriber follows.

15 Referring to Fig. 6 the tap logic circuit 35 of Fig. 1A decodes the data-coded power received at its data input for operating the tap switches 40 in the basic service module 112 and jamming oscillators 116a,b to control the access of the subscriber to the programs.

20 In Fig. 6 the coded power pulses are continuously applied to the input of the 18-bit shift register 264. Each positive going edge of the received coded power signal triggers a monostable multivibrator 525, the inverted output of which illustratively is a 6.2 milli-second pulse which is applied to the positive edge triggered clock input of shift register 264 and serves to detect the data on the power and to shift the 18 bits stored in the register one bit position to the right. At the end of a 6.2 ms. pulse triggered by a 120 Hz cycle ("0" bit), the coded power will be negative, and entered into the shift register as a "0".

35 At the end of a 6.2 ms. pulse triggered by a 60 Hz cycle ("1" bit), the coded power will be positive, and entered into the shift register as high or "1". In this way, shift register stores an 18 bit of the coded power pulses, that segment changing as each new coded power pulse occurs by dropping the last bit and inserting the new bit.

40 The third through twelfth bits of the data word stored in the shift register 264 are continuously compared with the ten bit address assigned to the subscriber tap in the comparator 266 by means of switches 268. The output of the comparator 266 is applied to an AND gate 300. Also applied to inputs of the AND gate 300 are the first and last bits of the word stored in the 18 bit shift register (that is the stop and start bits, respectively) and a parity signal from a parity tree 302. The parity tree 302 adds the "1's" in the shift register 264 and puts out a high signal (logical "1") only when the sum is even. The parity of the coded power signal is made even in the power supply logic 108.

60 When the comparator 266 indicates that the subscriber tap address received in the shift register 264 is identical to the tap address assigned to the particular subscriber tap, that the start and stop bits are equal to "1" in

the respective first and last positions in the shift register and that parity is even, an enabling signal from the AND circuit enables a one-of-14 decoder circuit 304.

65 The one-of-14 decoder 304 is supplied with the thirteenth through sixteenth bits from shift register 264 and decodes the four bit control function portion of the 18 bit data word to determine which control function is desired. The one-of-14 decoder 304 enables one bit position of a 12 bit latch circuit 306. The on-off control bit which position is the 17th bit of the data word in the shift register 264, is applied to each of the 12 latches in the latch circuit but only the latch selected by the 1-of-14 decoder 304 is actuated in accordance with the on-off control bit. The 1-of-14 decoder also responds to two master codes that will produce logic signals to set all 12 latches to a "1" or reset all 12 to a "0". The outputs of the latching circuit 306 in turn control 12 switch current drivers 308 which are connected to and which control the RF switches 40a-c.

70 Thus the 12 RF switches, controlled by the switch current drivers in the latch circuit 306, may control specific channels of programming as well as the respective subscriber's total service for each of four subscribers. For example, one of the RF switches may be a double-pole double-throw switch which in one position opens the circuit between the subscriber's tap transformer 234 and the tap port 49 to which a television receiver converter is connected while in the other position the tap transformer and terminal output are suitably connected for television viewing by the subscriber. Good performance has been achieved using inexpensive PIN diodes to accomplish the switching.

105 A charged capacitor may be provided as a back-up power source to maintain the states of the switches 40a-c in the event of a brief power failure. If the power failure is of sufficient duration to cause the capacitor to discharge, provision is then desirably made to set all switches 40a-c to provide all services to all subscribers.

110 There are several possible approaches to deactivating specific channels. In one approach, an LC type of trap with a single-pole single-throw switch across it is employed in a T design. When the switch is closed, the trap is short-circuited and the program for that channel passes. When the switch is open, the trap blocks the program. A more complex approach is a pi type of filter which requires a double-pole double-throw switch. A further approach to single channel deactivation is the use of an oscillator to jam the particular picture carrier. The oscillator may provide a signal at a single frequency, which is for example the carrier frequency, or at a variable frequency, or it may provide narrow band

noise as the jamming signal.

An RF switch arrangement 40a-c used in a preferred embodiment of the invention is schematically illustrated in Fig. 7. Each of the switches 40a-c has a control input 310 and an RF input 312. To the RF input 312 for each switch 40a there is applied the basic program signal (e.g. all television programs), and for each switch 40b and 40c to its RF input 312 is applied the jamming oscillator signals. When a low control signal (negative voltage) is applied to the control input 310, i.e., when the control function bit has a logical value of "0", diodes 314, 316 and 318 are forward biased and hence conduct. Diodes 320 and 322 are then back biased and therefore non-conducting. The switch is then "off". Inductors 324, 326, 328, 330 and 332 provide RF isolation. Capacitors 334, 336, and 338 provide DC isolation.

When the control signal applied to input 310 goes high, diodes 314, 316 and 318 are back biased and non-conductive while diodes 320 and 322 become forward biased and hence conductive thereby providing electrical continuity between the RF input 312 and the output 340 of each switch 40a-c. The switch is then "ON". The switching current applied to the switches 40a-c by the switch current drivers 308 may be on the order of 1 to 3 milliamperes.

Referring now to Fig. 8 of the drawings, a jamming oscillator 116a,b used in a preferred embodiment of the invention is shown schematically. The jamming oscillator 116a,b has a power input 350 at which there is applied 4.2 volts DC from the DC output of the power supply 120. The AC signal from the secondary winding of the transformer 234 in the power supply 120 is applied to a "wobble" input 352 of the jamming oscillator. Coil 354 and capacitor 356 filter the input power. The input direct voltage biases the base of an oscillator transistor 358 at a

nominal level through resistor 374. The base voltage of the oscillator transistor 358 is varied by applying the AC signal to the base of the transistor 358 via the wobble input 352. The collector of transistor 358 is connected to DC power through RF choke 372.

A tank circuit for determining the oscillator frequency includes capacitor 364 in series with the parallel combination of inductor 360 and capacitor 362. In addition, a varactor diode 366 is connected between ground and the base of the transistor 358 forming a part of the tank circuit. The AC power signal from the secondary of the transformer 234 applied to the wobble input 352 is filtered by an RC filter including resistor 368 and capacitor 370. The circuit goes into oscillation at the tank resonant frequency. The output voltage from the collector of the transistor 358 is fed back to the base of the transistor through the intrinsic collector-to-base capacitance. As the voltage across the varactor diode 366 changes so does its capacitance and as this capacitance changes, the resonant frequency of the tank circuit of the oscillator is varied. Hence, the signal at the collector of the transistor 358 has a variable frequency oscillation suitable for jamming the television program carrier signal the frequency of which is within the frequency variation range of the jamming oscillator 116a,b. The output of the jamming oscillator transistor 358 is applied to a band pass filter including capacitors 376, 378, 380 and 382 and inductor 384 to confine the jamming signals to the desired band and prevent interference with other channels.

The following tables 1-3 illustrate some of the various respective combinations of apparatus units which may be included at the head end, power units, and addressable taps of a cable television system according to the invention. The tables are exemplary only and are not intended to disclose all possible combinations of apparatus employable at the head end, power units or taps.

TABLE 1

## HEAD-END CONTROL UNIT COMBINATIONS

	1	2	3	4	5	6	7	8	9	10	11	12
<u>Component Units</u>												
A. Interface Unit	0	0	0	0	0	0	0	0	0	0	0	0
B. CPU & Keyboard	0	0	0	0	0	0	0	0	0	0		
C. CRT		0	0	0	0	0	0	0	0	0		
D. Printer			0			0	0	0		0		0
E. Small Tape Store				0		0						
F. Large Tape Store					0		0	0				
G. Real Time Clock								0				
H. Large Main-Frame Interconnect									0	0		
I. Manual Unit											0	0

Table 1 illustrates 12 possible combinations of component units which may be used at the head end, in the general system of Fig. 1.

- 5 The following is a brief description of the nature of one form of the component units listed in the table.

10 *Interface Unit* — A device for converting the entered data to binary form for storage in the parallel/serial register at the head end and for adding stop, start and parity bits.

15 *C.P.U. & Keyboard* — A keyboard for entering data into the memory (e.g. register) of a central processor unit (e.g., a modified desk calculator).

*CRT* — a cathode ray tube for displaying the entered data.

20 *Printer* — A device for typing the entered data on a paper record for subsequent reference.

*Small Tape Store* — A device for recording the data, as it is entered, on a magnetic tape loaded in a small cassette.

25 *Large Tape Store* — A device for recording the entered data on magnetic tape stored on large reels, e.g., as in a reel-to-reel recorder.

30 *Real Time Clock* — A timer for causing the data to be transmitted at predetermined times for enabling and disabling specific ser-

vices of individual subscribers at those times.

*Large Main-Frame Interconnect* — A device for connecting the head end data transmitting apparatus to a remote computer wherein data is processed, transmitted to the head end and then encoded on the RF carrier signal at the head end for transmission to the power units and subscriber taps.

*Manual Unit* — A device including manually actuated switches for entering data into the shift register at the head end for encoding on the transmitted RF carrier.

This Table, 1, shows twelve possible combinations of such units, a zero in a numbered column and opposite a vertically listed component unit indicating that that particular component unit is used in combination with other units having "0" in the same column. For example, in combination 3 of Table 1 a keyboard is used for manually entering the power unit address, tap address and control function data into the memory of a central processor unit, whose data may be displayed on a cathode ray tube, typed on a printer, and converted for coding on the RF carrier signal by means of an interface unit.

Table 2 illustrates 8 possible combinations of component units for use in a cable system power unit.

TABLE 2

## POWER UNIT COMBINATIONS

	1	2	3	4	5	6	7	8
<u>Component Units</u>								
A. Standard Power Unit	0	0	0	0	0	0	0	0
B. 60Hz Keyer	0	0			0			0
C. Battery Pack		0		0	0	0		
D. Data Keyer Unit			0	0		0	0	
E. Status Transmitter					0	0	0	0

These units are:

5 *Standard Power Unit* — A saturation transformer for use in cable television systems for regulating the power from the mains.

10 *60 Hertz Keyer* — A device having inputs at which positive and negative direct voltages are applied and an output at which there is generated 60 hertz power signals for continuously energizing where the power is un-

*Battery Pack* — A device employing conventional batteries to provide a supplementary

voltage source, usually for backing up the system power supplies in the event of brown-

15 *Data Keyer Unit* — A device for controlling the system power switch 22 for encoding the power according to the data encoded on the RF carrier transmissions from the head

20 end. *Status Transmitter* — A device which can be remotely interrogated from the head end to determine if the power unit or specific circuits therein are functioning properly.

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TABLE 3 (Continued)

## SUBSCRIBER TAP COMBINATIONS

	17	18	19	20	21	22	23	24	25	26	27	28	29	30
<b>Component Units</b>														
Tap	0	0	0	0	0	0	0	0	0	0				
Basic Service Module	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CH.A Trap														
CH.B Trap						0								
House Feed-Thru			0				0	0						
CH.A Oscillator				0		0	0	0						
CH.B Oscillator				0	0			0		0				
Single CH Converter		0							0	0				
Block Converter		0												
Transponder	0										0			
Reverse Path Switch												0		
Reverse Path Atten.													0	
Section Bypass														0

Table 3 illustrates 30 possible combinations of component units which may be used in a tap of an addressable subscriber control system according to the invention.

5 These units are:

*Tap* — An input device to the addressable subscriber tap for deriving the RF transmissions from the cable.

10 *Basic Service Module* — A device for receiving the television program information for all channels at the addressable tap and supplying it through frequency converters to the television receivers of the subscribers.

15 *Channel A Trap* — A filtering device for removing from the RF television program signal a band of frequencies associated with one specific channel ("A") to prevent reception of that channel.

20 *Channel B Trap* — A device similar to the channel A trap but tuned to filter out a different channel ("B") of television programming.

*House Feed-Thru* — An optional added

device for delaying the coded data received at the subscriber taps to a location within the homes of the respective subscribers for controlling one or more devices within the subscriber's home.

*Channel A Oscillator* — A device for providing a signal within the frequency band of a particular channel ("A") for jamming that channel thereby preventing its reception by a subscriber.

*Channel B Oscillator* — A device similar to the channel A oscillator but tuned to a different frequency band for jamming another channel ("B").

*Single Channel Converter* — A device for receiving one channel of television information on one frequency or group of frequencies incompatible with a subscriber's television receiver and for converting the television program information to another channel frequency or group of frequencies compatible with the subscriber's television receiver for reception of the channel.

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*Block Converter* — A device for simultaneously receiving signals containing several channels of program information and for providing at respective outputs separate channel signals each of which corresponds to a different channel tunable by a subscriber's television receiver.

*Transponder* — A device which can be remotely interrogated (e.g., from the head end) for transmitting a signal from the tap to indicate the condition of cable system components at the tap or along the return transmission path.

*Reverse Path Switch* — A switch for use in a two-way system and operable from a remote location (e.g., at the head end) for selectively enabling or disabling the flow of signals from the tap along a return path toward the head end, as for example in trouble shooting cable faults or by-passing malfunctioning component disposed in the cable path.

*Reverse Path Attenuator* — A device for selectively attenuating, but not completely blocking, a signal transmitted along the return path from the tap for use in trouble-shooting the cable system.

*Section By-Pass* — A parallel cable branch providing an alternate path for signals in the event of a malfunction in a portion of the primary cable path.

*RF Module* — A device for receiving control data coded on an RF signal (as opposed to the coded power transmissions) for controlling subscriber access to the cable system.

The previously disclosed basic service module may be replaced by an RF receiver basic service module for special services and in cases where the system requires a number of terminal points in excess of the 4,096 subscriber control points which are provided for each power unit in the preferred embodiment. The oscillators, traps and converters may have selectable frequencies or frequency bands.

In addition to controlling a subscriber's access to the cable transmission system and for controlling individual selected channels, there are other functions in which the present invention may be applied, which do not relate to subscriber access.

Although the preferred embodiment of the invention has been described for use in a cable television system it is to be understood that the invention has utility in applications other than cable television broadcasting and may be used, for example, in any situation wherein power and signal intelligence are transmitted to a common apparatus. For example, electrical utility companies can use the invention to control the power consumption, using measuring apparatus located at each consumer's residence or facility for billing one type of usage (e.g. heating) at a rate different from the rate for another type of usage (e.g. lighting) by coding the trans-

mitted power and installing at the measuring apparatus a decoder and switches responsive to the decoded data for switching between two types of consumption.

Communication systems such as telephone systems provide another example wherein the invention can be used to provide local control from a central station.

Various control functions at a locality can be controlled from a remote power generating point by coding on the transmitted power enabling signals at the time when a function is to be enabled and disabling signals at a later time when the function is to be disabled. The number of remote functions which can be controlled from a central station is virtually unlimited. Since the transmitted data is serially coded onto the transmitted power the only limit on the number of bits of information which can be used in a coded word is the time period to be allotted to the word.

Another example is in a two-way system where signals are sent from the head end and return signals are received at the head end. Transponders located at remote terminals, equivalent to subscriber taps, may be selectively actuated to test the return path from the remote terminal to the head end. Similarly, remote transponders may send back a signal containing data representing a measure of received signal quality. A further possible use of the present invention may be to actuate selected attenuators of known value distributed along the reverse signal path (that is, the path from the terminal to the head end) for use in trouble-shooting noise or spurious signals on the reverse path. Remote control circuits may also be actuated by similar means in order to provide alternate transmission paths when a main path fails due to a malfunction therein.

While in the example described above, each tap address code may serve up to four subscribers (the particular subscriber of the four being determined by certain bits of the command portion of the data signal), it will be understood that an individual address may be allocated to each subscriber, and the tap device may then respond to any of, say, four subscriber addresses to forward individual command signals for a particular subscriber.

It will also be understood that the present system for encoding and decoding power transmission (which may be regarded as using data signals for power) is not confined to use with the foregoing systems or even addressable taps, but is suitable for use wherever both power and data transmission may be desired. In addition, the particular encoding and decoding arrangement is not restricted to use of 60Hz/120Hz, but other similarly related frequencies may be used.

Thus, while the invention has been described in terms of one application for which

it is particularly well suited, i.e. cable television systems where data words are coded on transmitted power, it is not to be confined to such systems but is defined by the following claims.

#### WHAT WE CLAIM IS:—

1. A control system responsive to a coding signal constituted by a succession of signal elements, each signal element being of one of two types, said system including an encoder providing alternating power having a succession of full cycles of either of two predetermined durations, each duration corresponding to and being representative of a respective one of said signal elements, whereby said power is encoded in accordance with said coding signal.

2. A system as in claim 1, wherein said coding signal represents binary data, and said signal elements are binary zeros and ones.

3. A system as in claim 1 or 2, wherein said power has full cycles of one of said durations in the absence of said signal elements.

4. A system as in claim 1, 2 or 3 further including a remote terminal and a control device thereat, both energized by said power, said terminal including a decoder deriving a representation of said coding signal from said encoded power, said control device being controlled by said coding signal representation.

5. A system as in any one of claims 1 to 4, wherein said durations are related in the ratio of 2 to 1, and each of said power cycles is of the same polarity.

6. A system as in claim 4 having one or more of said control devices, and one or more of said terminals, each terminal comprising an addressable tap device adapted to be coupled to at least one of said control devices, said coding signal representing the addresses and desired commands for said control devices, each said tap device including a controlling device energized by said encoded power and responsive to said desired command signals to place at least one of said control devices in at least one functional condition corresponding to a said command and a decoder energized by said encoded power and responsive only to control signals representing an address individual to said tap device for supplying to said control device signals representative of said desired command.

7. An apparatus for selectively addressing and controlling in accordance with coding signals, one or more power-consuming control devices associated with each of a plurality of remote power-consuming terminals to achieve one or more desired control functions at each of the remote terminals, wherein said power-consuming terminals are supplied with power from a common power unit, each coding signal being representative of a desired control

function to be effected at one particular remote terminal coupled to said power unit, wherein said power is alternating current, an encoder is associated with said power unit for causing individual cycles of said power to have either a first or a second duration in accordance with said coding signals, the encoded power being supplied to each remote terminal, and a decoder is provided at each remote terminal receiving said encoded power and deriving therefrom power for energising said decoder and said remote terminal control devices, said decoder also deriving from said encoded power the particular signal representative of the desired control function for the respective terminal and said control devices at said terminal being responsive only to said particular signal for performing said desired control function.

8. An apparatus according to Claim 7, wherein said coding signals are in the form of data words, each data word having an address portion representative of the location of a respective remote terminal and a command portion representative of the desired control function to be effected at that remote terminal, said decoder is responsive only to data words having the address portion representative of its respective terminal for actuating said control devices, and said control devices are responsive to only the data word command portion associated with said representative address portion.

9. An apparatus according to Claim 7 or 8, wherein said control devices are controlled from a central station, said coding signals being transmitted from said central station to said power unit, and wherein said central station is a program source for a wired broadcast system, having a cable system and power consuming devices supplied by said power unit over said cable system, said terminals are taps for supplying one or more subscriber stations with said programs, and said program signals are transmitted from said central station to said subscribers via said power unit and under the control of said terminal control devices.

10. An apparatus according to Claim 9, wherein said desired control functions include connecting or disconnecting a subscriber station from its respective terminal, and/or permitting or inhibiting transmission of a particular program to a subscriber, and/or jamming transmission of one or more programs to a subscriber.

11. An apparatus according to Claim 8, including a plurality of power units, wherein said remote terminals are subdivided into groups, each group receiving power from a respective one of said power units, and each said data word also includes a power-unit address portion and each said power unit includes a power unit decoder responsive only

to data words containing the address portion representative of its own power unit for enabling functioning of its power unit encoder only in response to reception of its respective data word address portion.

12. An apparatus according to any preceding Claim, wherein said coding signals are in the form of binary data, and said encoder produces for each binary "1" a single power cycle of said first duration and for each binary "0" a single power cycle of said second duration and of the same polarity, said encoder also producing full cycles of power of said first duration in the absence of any binary data.

13. An apparatus according to any preceding Claim, wherein said remote terminal decoder includes a circuit responsive to a cycle of said encoded power having said first duration for producing a first decoded signal and a cycle of said second duration for producing a second decoded signal, said control devices being responsive to said first and second decoded signals.

14. An apparatus according to Claim 9 or 10, wherein said transmitter arrangement includes a source of pilot radio frequency and a modulator for producing said coding signals in the form of pulses of said pilot frequency of varying duration.

15. An apparatus according to Claim 12, wherein said encoder includes a direct voltage source, a switching circuit for switching the output of said voltage source from either polarity to the other to produce an alternating power source, and a circuit initiating each of said single cycles in response to said coding signals with a switching operation to the same polarity, to cause all said single cycles to be of the same polarity.

16. An apparatus according to Claim 9, wherein said central station is a program source for a wired broadcasting system for disseminating programs to subscribers at said remote terminals and wherein said remote terminals are taps each for supplying one or more subscriber stations with said programs, said system further including means for transmitting said programs to said taps independently of transmission of said coded power, said control devices including switching devices for controlling access by said subscribers to said programs.

17. An apparatus according to any one of Claims 7 to 14, wherein said encoder includes a first direct voltage source of one polarity,

a second direct voltage source of opposite polarity, an output terminal, a switching circuit for alternately connecting said sources to the output terminal to produce an alternating signal, and a circuit responsive to said coding signals for controlling the duration of single cycles of said alternating signal.

18. An apparatus according to Claim 12, wherein said single full cycles are sequential and said decoder comprises a monostable circuit responsive to the leading edge of each cycle for producing an output pulse of a predetermined duration, and a shift register supplied with said cycles produced by said encoder and shifted by said output pulse, whereby the data stored in said register represents said binary zeros and ones.

19. A method for selectively addressing and controlling from a central station any of a plurality of remote power-consuming control devices respectively associated with a plurality of remote power-consuming terminals to achieve a respective desired control function at each of the remote terminals, wherein alternating current power is supplied to such plurality of power-consuming terminals from a common power unit, coding signals are transmitted to said power unit, each coding signal being representative of the desired control function to be effected at one particular remote terminal coupled to said power unit, the power is encoded such that individual cycles have either a first or a second duration in accordance with said transmitted coding signals and the encoded power is supplied to each remote terminal, the encoded power is received by a decoder at each remote terminal, power is derived therefrom for energising said remote terminal control devices, and the particular signal representative of the desired control function for the respective terminal is also derived therefrom, and said control devices perform said desired control function in response only to the said desired particular signal.

20. An apparatus for selectively addressing and controlling from a central station any of a plurality of power-consuming control devices, respectively associated with a plurality of remote power-consuming terminals to achieve a respective desired control function at each of the remote terminals, the apparatus being as hereinbefore described with reference to the accompanying drawings.

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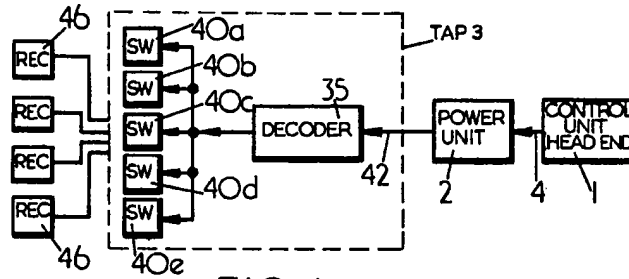


FIG. 1

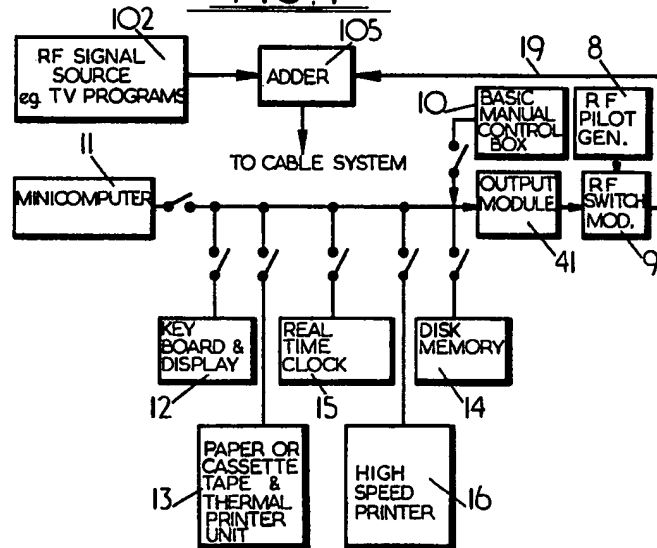


FIG. 2

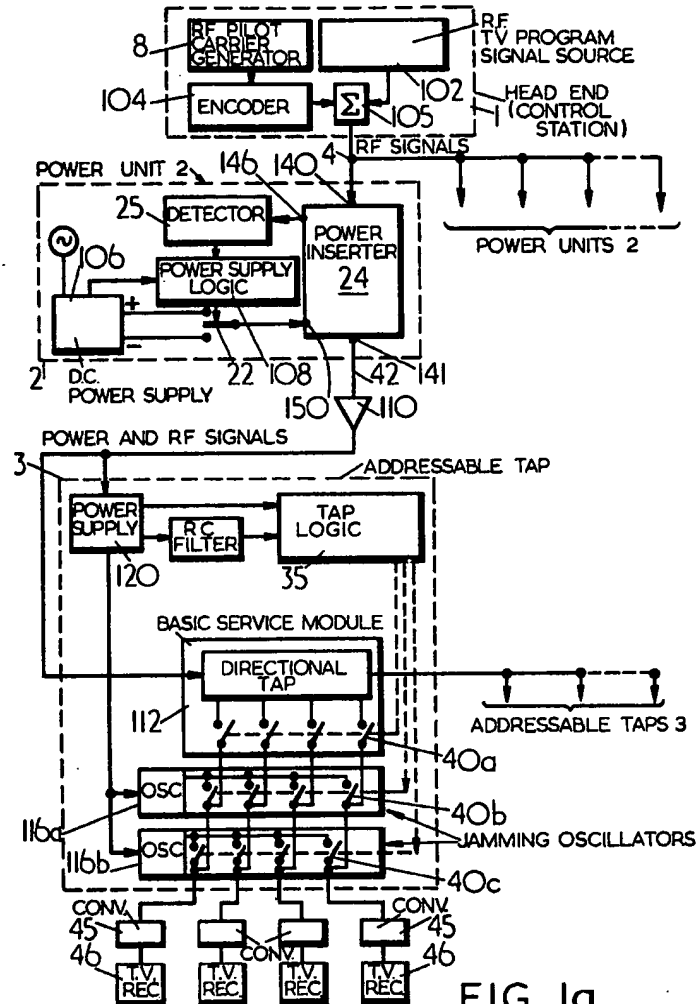


FIG. 1a

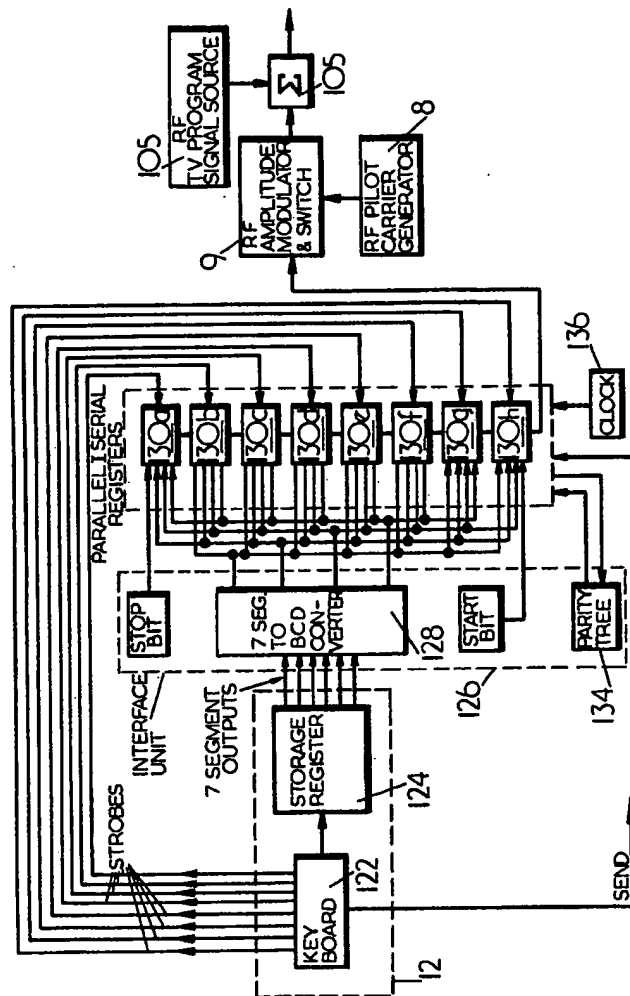


FIG. 2a

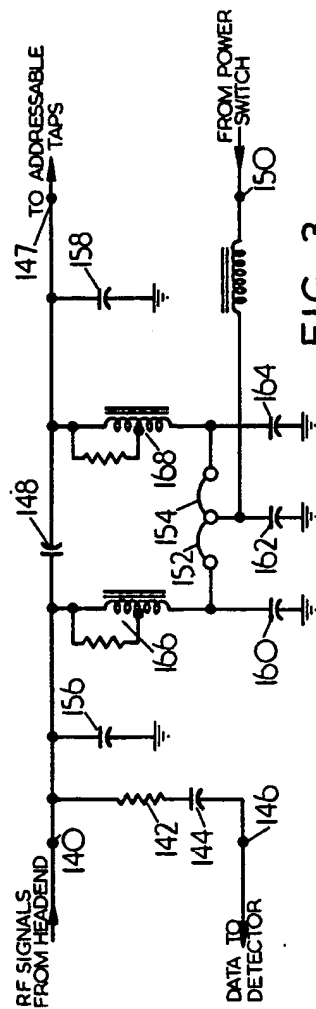


FIG. 3

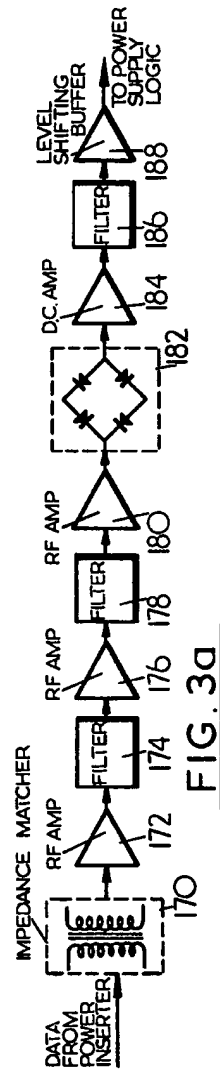
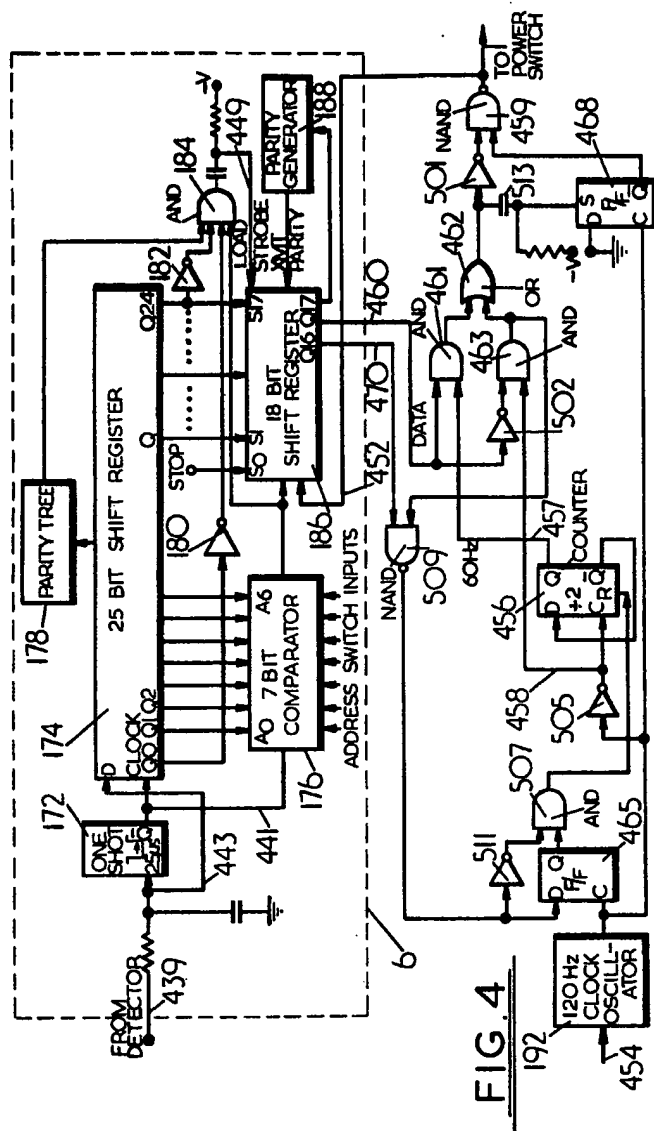


FIG. 3a





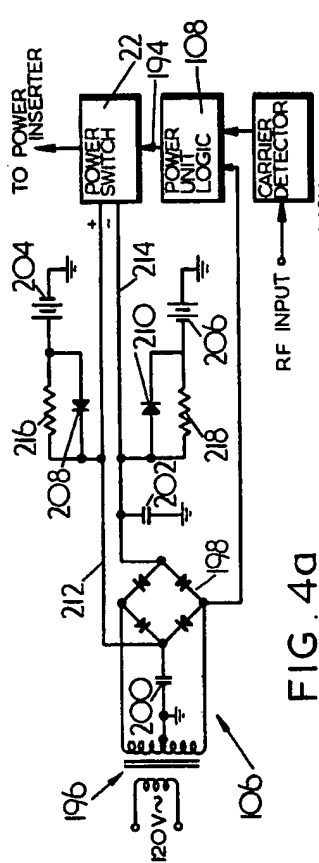


FIG. 4d

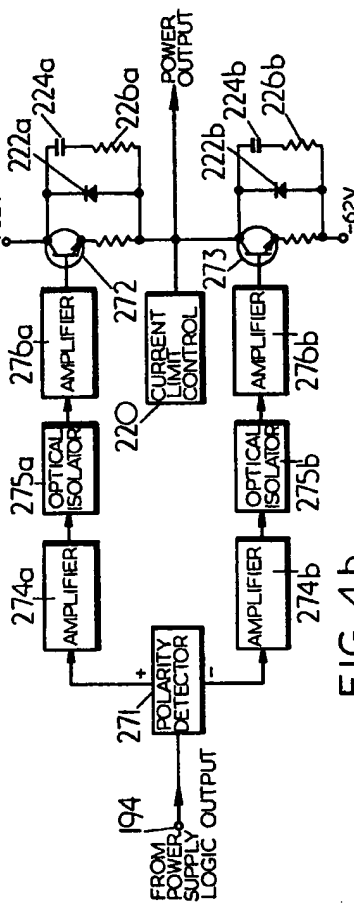
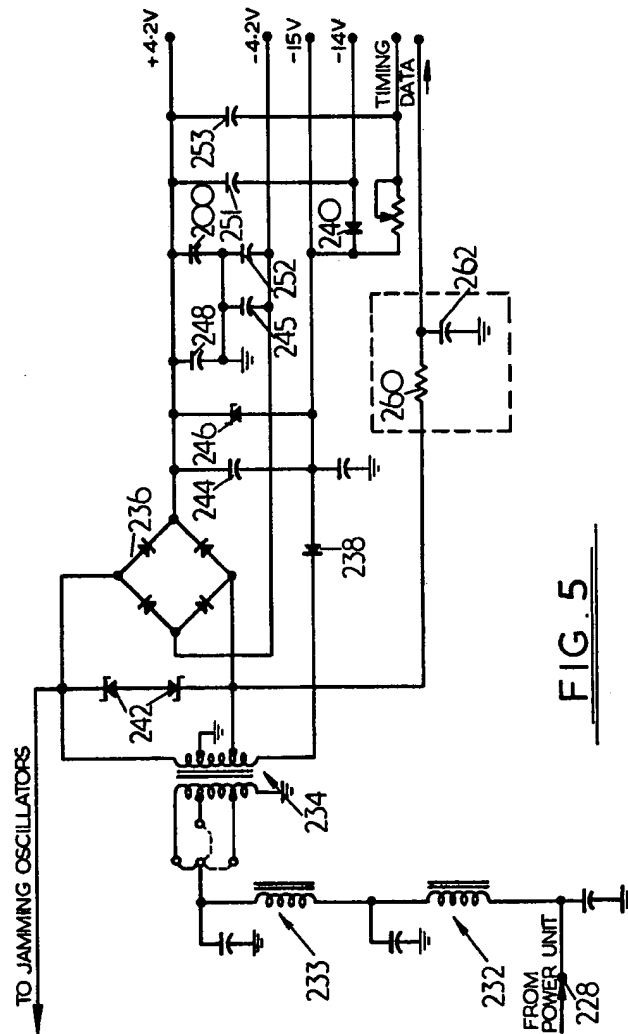
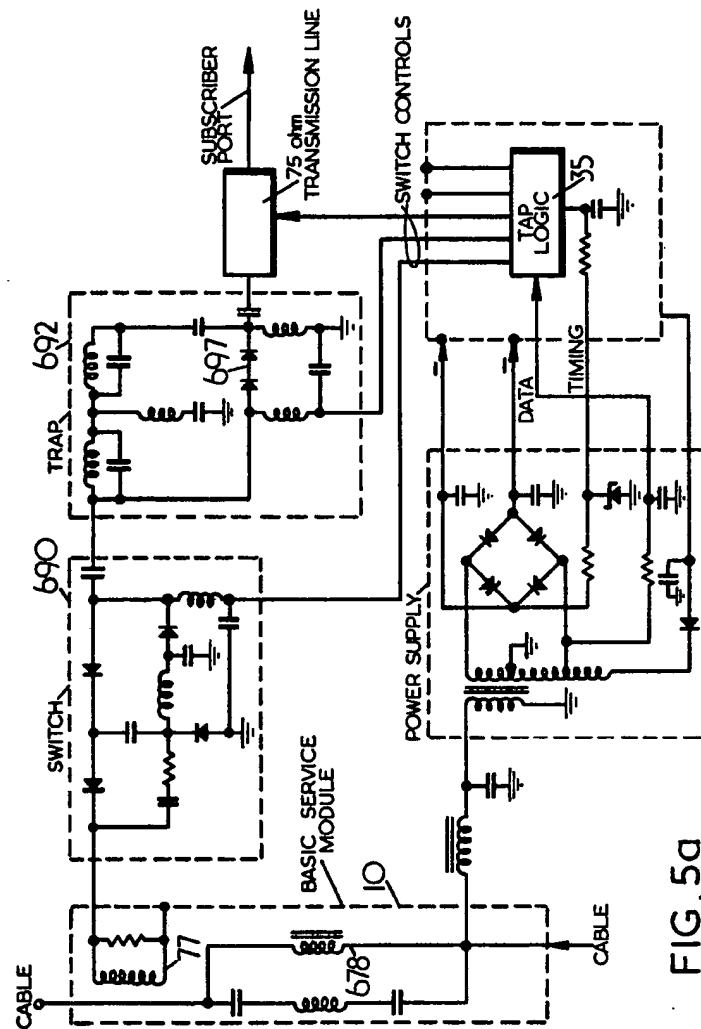


FIG. 4b



F/G. 5.



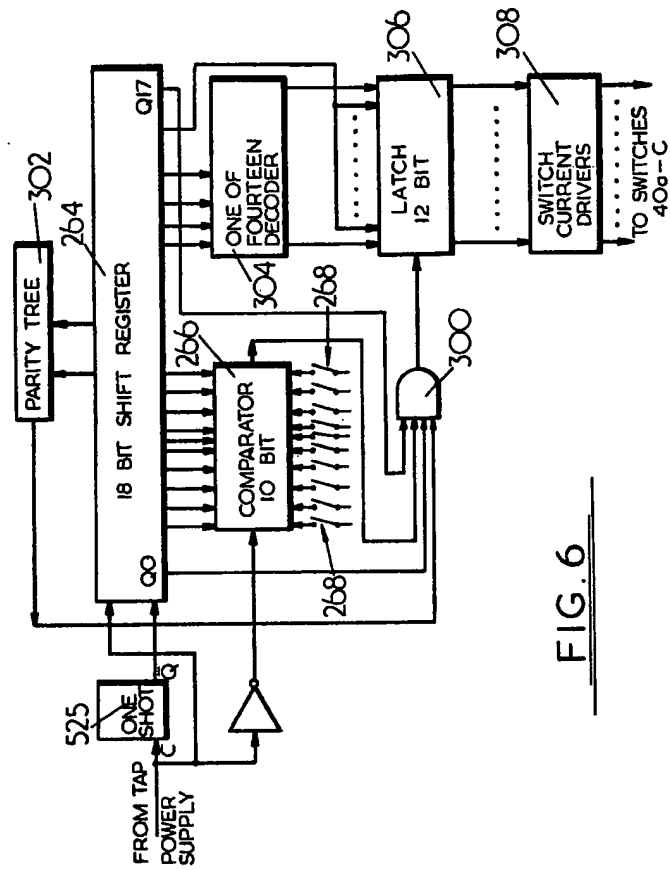
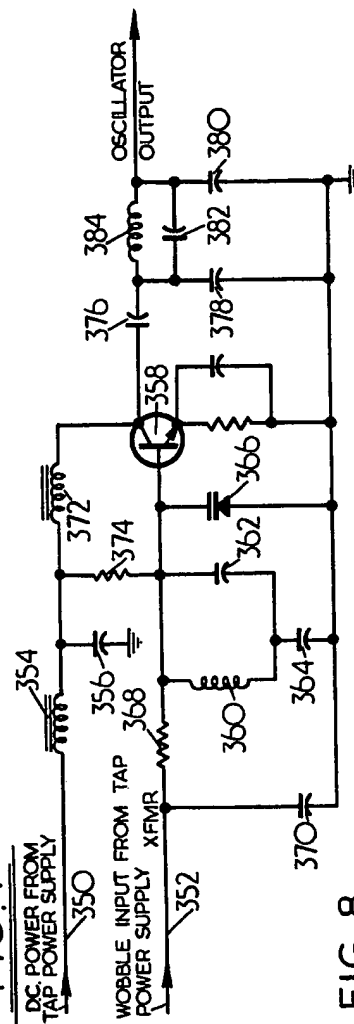
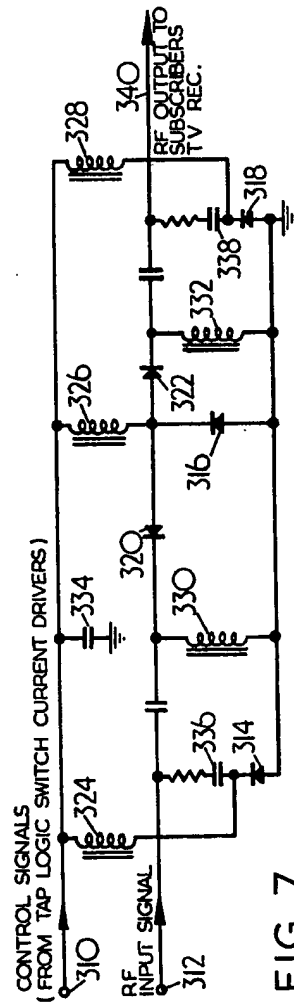
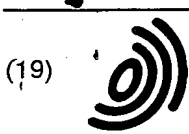


FIG. 6





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(54) On screen programme list display for multiple channel broadcasting systems

(57) An easy to use on-line guide provides the user of a multiple channel television broadcast system with a wealth of programming information in a simple format that is easy to understand. The guide enables the user to easily select a particular program to watch. In particular, when the guide is presented to the user, the guide covers only a portion of the actual television screen or display. The remaining portion of the television screen continues to broadcast the audio and video of the currently selected program. As a user scans through the guide and moves the pointer from one station to another, the system responds by automatically tuning to the channel pointed to by the pointer and provides the audio and displays the video in the portion of the screen not covered by the guide. Furthermore, a written description of the program currently broadcasted on a station that the cursor currently points to is also shown. In addition, the system provides an innovative mechanism to enable the user to scan program information of channels that the user has designated as his favorite channels. In another embodiment, a program list that is oriented according to the program, instead of the channel, is presented.

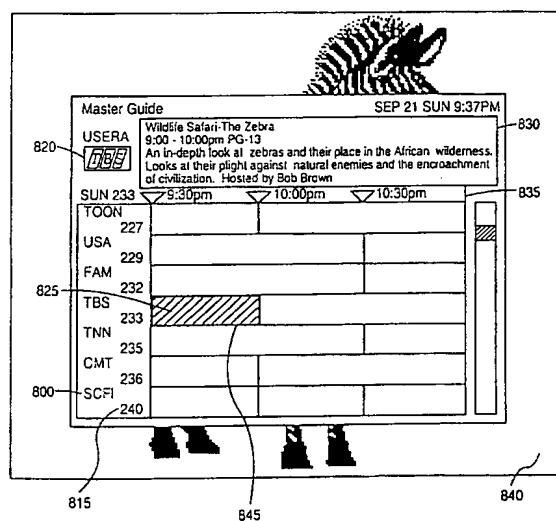


FIG. 8

## Description

This invention relates to multiple channel broadcasting systems, and more particularly (but not exclusively) to the presentation of channel, program, and/or broadcast information for a multiple channel television system.

Television broadcasting technology has improved tremendously since its inception. Today, television signals are broadcasted on the airwaves through cables and via satellite. The number of stations accessible today has increased from one to hundreds of stations. To select a program to view, many viewers simply "channel surf" until they find a channel that has a desirable program. Channel surfing refers to the process of using the channel "+" or "-" key to sequentially view each channel. Although some viewers find channel surfing among hundreds of stations enjoyable, most viewers prefer a more direct method for selecting a program to view.

Some systems, for example, the RCA Direct Satellite System™ or DSS™ (Direct Satellite System and DSS are trademarks of Hughes Communications, a division of General Motors Corp.), provides a television channel selection guide which displays a listing of the channels typically in numeric order and the titles of the programs broadcasted or to be broadcasted on the channels. A simplified block diagram of such a guide is illustrated in Figure 1. The viewer or user of the system may then select the channel by entering in the number or selecting the device. The system responds by removing the guide displayed and tuning to the station selected and displaying the broadcasting signals of the station.

This system has a number of drawbacks. The guide provides only the title of the program. To get additional information, such as a written description of the program, the user must select an information button which responds by bringing up a second layer of the menu having the program description. Thus, as the number of stations increase, the efficiency of reviewing programs and program descriptions decreases. This is further problematic as television stations, such as network stations, satellite TV, cable and Pay Per View stations will take advantage of the hundreds of channels that will be available for broadcast. A single source, e.g., a single station, may start broadcasting the same program on different channels as often as every 15-20 minutes to span its audience's viewing time preferences. For moves this is often referred to as "Near Video on Demand", because it attempts to provide the ability for a viewer to select a movie to view at any time. Furthermore, television viewers have favorite stations which they like to watch. The RCA system provides a channel skip function in which a viewer or user of the system can designate those channels that they prefer to view by selecting those channels from a displayed list of channels. Thereafter, using the channel "+" or "-" buttons, the user can sequentially view those selected channels. However,

this can be burdensome when there are many stations selected.

Respective different aspects of the invention are set out in the respective independent claims hereof.

Preferred embodiments of the invention described below provide:

a method and apparatus for selection of programs on a multiple station television system; and  
an indication of both broadcast signals and channel data to a viewer to enable the user to select a program to view without requiring the user to manoeuvre through multiple levels of menus.

The preferred embodiments of the invention provide an innovative but easy to use on-line guide to provide the user of the system with a wealth of information in a simple format that is easy to understand. Furthermore, the guide enables the user to easily select a particular program to watch. In particular, when the guide is presented to the user, the guide covers only a portion of the actual television screen or display. The remaining portion of the television screen continues to broadcast the currently selected program. As a user scans through the guide and moves the pointer from one station to another, the system responds by automatically tuning to the broadcast pointed to by the pointer and provides the audio and displays the video in the portion of the screen not covered by the guide. Thus, the user can easily get an idea of the broadcast on a particular station without exiting the guide and without expressly selecting a particular channel.

Furthermore, in one embodiment a written description of the program currently broadcasted on a station that the cursor currently points to is also shown. Thus, the user is provided the audio and video of a particular program as well as a written description of the program and the ability to easily preview another station broadcasted another program simply by moving the pointer. Once the user determines that a particular station is to be viewed, the user simply indicates selection by depressing the corresponding key on the receiver or remote control device which then functions to remove the guide. If the viewer exits the guide without selection of a station, the system automatically tunes back to the station that the system was tuned to at the time the guide was entered.

In an alternate embodiment of the present invention, the system provides an innovative mechanism to enable the user to scan program information of channels that the user has designated as his favorite channels. A button is provided that is designated as "favorite". When the user is in a broadcast guide and selects the button, the system responds by displaying program information regarding the favorite stations at the top of the guide. Thus, the user will see at the top of the list the current programming with respect to his favorite stations, followed by program information for the remaining sta-

tions.

In another embodiment, the present invention presents a guide that is oriented according to the program instead of the channel. In particular, the guide provides program information and broadcast time information. The guide is organized in an XY grid with the X axis displaying a certain block of time (e.g., two hours) and the Y axis displaying program information organized independently of channel information. For example, the Y axis may display program titles organized in alphabetical order. The X axis displays the time or times each program is displayed by highlighting the corresponding time slot. Other embodiments provide the generation of the program guide according to the category of programming the user is interested in.

The invention will now be further described, by way of illustrative and non-limiting example, with reference to the accompanying drawings, in which:

Figure 1 is a simplified illustration of a prior art direct digital satellite system guide display.

Figure 2 is a simple illustration of one embodiment of the present invention.

Figure 3 is a block diagram representation of elements utilized in the receiver of the television signals.

Figure 4 is a representation of a remote control utilized to tune television stations.

Figure 5 is a simplified block diagram of circuitry utilized in a remote control device.

Figure 6 illustrates the type of data utilized to present an electronic program guide.

Figure 7 illustrates the pointers to the data utilized to generate the electronic program guide.

Figure 8 illustrates a Master Guide presented to enable the viewer to view programming that is broadcast and is to be broadcast.

Figures 9A, 9B and 9C illustrate one embodiment of the present invention in which a broadcast audio and video is displayed behind the Master Guide to enable the viewer to easily determine programs to watch without the need to navigate through multiple levels of menus or to switch between menus and broadcasts.

Figure 10 is an exemplary flowchart illustrative of the functionality provided in one embodiment of the present invention.

Figure 11 is an illustrative display of a channel banner.

Figure 12A is an exemplary display of the main menu of one embodiment of the present invention.

Figure 12B is an example of the system menu in one embodiment of the present invention.

Figure 12C is illustrative of a custom setup menu in one embodiment of the present invention.

Figure 12D and 12E illustrate the electronic messages feature.

Figure 12F illustrates the skip stations feature available to the user.

Figure 13A is an illustrative display of a category selection guide.

Figure 13B is an illustrative display of a subcategory guide.

Figure 13C is a descriptive flow diagram illustrating the selection of categories and subcategories.

Figure 14A is an illustrative display of a displayed station index.

Figure 14B is a descriptive flow diagram illustrating the use of the station index of Figure 14A.

Figure 14C illustrates the selection of a station using the station index.

Figure 15 is an example of an electronic programming guide.

Figure 16A, Figure 16B and Figure 16C illustrate the use of a user's favorite stations function.

Figure 17 is an illustration of the favorite station guide.

Figures 18A and 18B illustrate menus for setting up the user favorite stations.

Figure 19 is a flow diagram illustrating the process of moving among channels having the same programming category.

Figure 20 is a simple block diagram of the components of the program list.

Figure 21 is an exemplary flow diagram illustrating a process for generating the program list display.

Figure 22 is an exemplary flow diagram illustrative of the process for using the program list.

Figure 23 is an exemplary display of the main menu of one embodiment of the present invention.

Figure 24 is an example of a display used to select program categories in one embodiment of the present invention.

Figure 25 is an illustrative display used to select subcategories.

Figure 26 is an illustrative display of a program list.

Figures 27A and 27B are illustrative displays to enable the user to purchase pay-per-view programs.

Methods and apparatus in accordance with preferred embodiments of the invention will now be described. In these methods and apparatuses, the broadcast system described is a direct broadcast satellite system. However, it is readily apparent to one skilled in the art that other broadcast systems which have the capability of receiving and displaying a multiplicity of stations may utilize a method and/or apparatus embodying the invention. Furthermore, in the following description, for purposes of explanation, numerous details are set forth, such as menus, flowcharts and system configurations, in order to provide a thorough understanding of the invention. However, it will be apparent to one skilled in the art that these specific details are not required in order to practice the invention. In other instances, well known electrical structures and circuits are shown in block diagram form in order not to obscure the present invention.

Figure 2 is a simplified diagram illustrating a Direct Satellite System (DSS). The system has an antenna 3, an integrated receiver/decoder 2 (IRD), a remote con-



troller 5 and a monitor 4. The packets are transmitted by a transponder on the satellite. Each transponder transmits data in a time share manner at a predetermined frequency. A tuner 21 of a decoder is tuned in to the frequency of the transponder corresponding to a channel, which is designated by a viewer so that the packets of digital data are received by the decoder.

The antenna 3 receives an encoded data signal sent from a satellite. The received encoded signal is decoded by the IRD. The antenna 3 has a low noise block down converter 3a (LNB). The LNB 3a converts a frequency of a signal sent from the satellite to another frequency. The converted signal is supplied to the IRD 3. The monitor 4 receives a signal from the IRD 3.

**Figure 3** is a block diagram of the IRD 3. A radio frequency (RF) signal output from the LNB 3a of the antenna 3 is supplied to a tuner 21 of a front end 20. The output from the tuner 21 is supplied to a QPSK demodulation circuit 22 for demodulation. The output from the QPSK demodulation circuit 22 is supplied to an error correcting circuit 23 for error correction. The data is received in encrypted and encoded (i.e., compressed) form.

The transport IC 24 receives the data stream, consisting of packets of data, from the error correcting circuit 23 and directs portions of the data stream to the appropriate circuit for processing. The digital data stream sent from a satellite includes headers for classifying the different portions of the data in the digital data stream. The transport IC stores the headers in registers and uses the headers to direct the data. The data stream sent from the satellite, includes video data in the format specified by the Motion Pictures Expert Group standard (MPEG), MPEG audio data and electronic programming guide (EPG) data. Data that is identified by its header to be video data is transferred to MPEG video decoder 25. Data that is identified by its header to be audio data is transferred to MPEG audio decoder 26. Similarly, data having a header that identifies the data to be EPG data is transferred to a predetermined area in the data buffer 51 designated to store the EPG.

A conditional access module 33, includes a CPU, a ROM and a RAM. The conditional access module determines whether the user has the authorization to receive certain data, e.g., audio/video for a pay TV station, using the authorization information stored in its memory. Thus, if the conditional access module determines that the user is authorized access, a key to decrypt the incoming data is provided to the transport IC 24, which decrypts the data using the key provided. In the present embodiment, a smart card is utilized. This card is inserted into the card reader interface 32 for interface to the transport IC 24. It is readily apparent to one skilled in the art that the conditional access module is not limited to smart cards and may be configured in other kinds of circuitry.

The MPEG video decoder 25 decodes the video signal received from the transport IC. DRAM 25a, connect-

ed to the MPEG video decoder 25, is used for buffering and storage of video data during processing by the MPEG video decoder. The decoded digital video signal is supplied to an NTSC encoder 27 and converted to a luminance signal (Y) and a chroma signal (C) which are respectively output through a buffer amplifier 28Y or 28C as an S video signal. A composite video signal is also output through a buffer amplifier 28V.

The MPEG audio decoder 26 decodes the digital audio signal. DRAM 26a, connected to the MPEG audio decoder 26, is used for buffering of data and information during processing by the MPEG audio decoder 26. The decoded digital audio signal is converted into an analog audio signal by D/A converter 30. The left audio signal is output through buffer amplifier 31L and the right audio signal is output through buffer amplifier 31R.

An RF modulator 41 mixes a composite signal output from the NTSC encoder 27 with an analog audio signal output from the D/A converter 30.

The RF modulator 41 converts the mixed signal into an RF signal and outputs the RF signal therefrom.

The CPU 29 is the central control mechanism and executes code stored in the ROM 37 to perform certain functions of the system. For example, the CPU processes certain data to control the generation of the program list in accordance with the teachings of the present invention. In addition, the CPU receives and processes the user input, received from the front panel buttons or switches 40 and the photodetector circuit 39 to provide the user functionality and access to the system described herein. In addition, the CPU accesses user settings/preferences for processing of information and configuration of the system. The user settings are stored in the non-volatile memory, such as EEPROM 38. In addition, the CPU maintains a list of pointers, stored in SRAM 36, to the channel information and program information stored in the SRAM 51. Thus, when a user wishes to display a form of the EPG on the screen, the CPU 29, accessing pointers stored in the SRAM 36, communicates to the transport IC 34 to retrieve the data from the data buffer (SRAM) 51 identified by the pointers. The CPU then formulates the format and other digital data which forms the guide or list on the screen and forwards the data representative of the guide/list to the transport IC 34 which forwards data the DRAM 25a of the MPEG video decoder 25 for subsequent output to the screen.

**Figure 4** shows an example of a remote controller utilized by a user to transmit commands and make program selections in embodiments of the present invention. Figure 5 is simplified a block diagram of the remote controller. The remote controller 400 has an infrared originating device 405, a set of operation buttons 410, a CPU 415, a ROM 420 and a RAM 425. The CPU 415 receives a signal sent from an operation button 410 through an input port 430. The signal is processed according to a program stored in the ROM 420. The RAM 425 is used as a working space so as to produce a trans-

mitting code. The transmitting code is sent to the infrared originating device 405 through an output port and converted into an infrared signal. The infrared signal is transmitted to the IRD. The operation buttons 410 include a direction key for designating a pointer direction such as north, south, east and west, an "EPG" key, a "FAVORITE" key, a "SELECT KEY", a "MENU" key, an "EXIT" key, a ten-key numeric keypad and an "ENTER" key. The set of operation buttons 410 enable the user to select programs through the electronic programming guide.

**Figure 6** is a block diagram illustration the data stored in a portion of the data buffer RAM 51. As noted above, the RAM 51 stores EPG data including guide data, channel data and program data. General information is included in the guide data, for example, the current data and time. The transponder list identifies the number of the transponder transmitting a segment. The channel list identifies the channel number of the first channel of a portion of data. The channel data includes data relating to channels, such as the channel number, channel name (i.e., the call sign of a broadcast station), logo ID (i.e., an identification of the channel logo), data ID, which is an identification of a channel number of MPEG video data or MPEG audio data, number of programs, which identifies the number of programs to be transmitted on a channel during a predetermined time frame, first program offset which identifies the offset from the header to the first channel data in a segment.

The program data includes the program title, start time of the program, time length of the program, program category such as movies, news, sports, etc., program sub-category such as drama, horror, children's movies or baseball, basketball, football for the sports category, the movie rating and program description that provides a detailed description of the program.

**Figure 7** illustrates how pointers to the EPG data is sorted for display of a guide on the user's television screen. As noted above, EPG data includes guide data, channel data and program data which are stored in the Data Buffer (RAM) of IRD (as shown in **Figure 3**). When a viewer selects a channel, the CPU of the system determines the packet containing the channel information and extracts the transponder number from the channel information. The system front end starts tuning in the frequency of the designated transponder so as to receive the data transmitting from that transponder. If a viewer does not select any channel, the last channel is designated.

As noted above, the CPU generates a table of pointers 736 to the EPG stored in the memory. The table 736 is used for changing the order of channels or programs according to the information to be presented in the guide to the user. The table 736 includes an entry for the address pointer to the corresponding channel data and an entry to the corresponding program data.

A table for generating display information is stored in the ROM 37. Certain data from the table is read out

from the ROM 37 and stored in DRAM 25a. Preferably the data is stored in compressed form. Therefore, when a character is displayed on a screen, the compressed character array is decoded so as to generate the character to be displayed. The encoder references a dictionary which includes a set of words and frequently used portions of words and numbers corresponding to each word or portion of a word. The encoder encodes each word to each number by using the dictionary. The decoder references the same dictionary as the encoder to perform the decode function. Once decoded, each character of the decoded word includes a character code corresponding to an ASCII code. Nonvolatile memory (e.g., EEPROM 38) has two tables. The first table contains character bitmaps in the different fonts available for each character. The second table identifies the address in the first table at which to extract the character bitmap. The address is determined according to the character code. The bit map image of the character is transmitted to DRAM 25a and subsequently accessed to display the character on the screen.

In the present embodiment, the channel data is received from a predetermined transponder and the channel number and channel name are stored in DRAM 25a. Additional channel information such as the channel logo is stored in the ROM 36. The ROM 36 preferably includes a table of Logo IDs and the address of Logo Data stored in ROM 36. Therefore, once a Logo ID is determined, the address of the Logo Data is determined, retrieved and stored in DRAM 25a.

The channel data provides the beginning address of the program data for a particular program. The actual location on the screen the program information is displayed is dependent upon the format of the guide. For example, in a time-based system, the location where the program title is displayed is determined by the start time and time length stored in the program data.

Using this information downloaded from the satellite transmission, programming and channel selection information is provided to the viewer. In the present system and method, this information is provided to the user in an innovative manner in order to enable the viewer to easily determine and select stations or programs to be viewed. For example, **Figure 8** illustrates a Master Guide that provides such information as the channel call sign 810, channel number 815 in the system, the channel logo of the selected station 820, a highlight 825 indicating the location of the system pointer operable by the arrow direction buttons, a program description 830 for the program the system pointer is located at, as well as program time information 835.

This guide is superimposed on the broadcast of channel 840 at which the system pointer is located. Thus, the user not only is provided the television system data showing the television channels, times of broadcasts of programming and descriptions of programs, but is also provided the audio and video of one channel, all on the same menu level of the guide. By movement of

the pointer 845 (in the present example, by manipulation of the information highlighted), the channel tuned to will change automatically, enabling the user to stay in the menu while still previewing in part the actual channel highlighted on the guide. This process is illustrated by **Figures 9A, 9B, and 9C**.

Referring to **Figure 9A**, the program currently broadcast on TBS is currently displayed in the background 940. If the viewer were to move the pointer by a joystick or similar device or by simply pressing the appropriate arrow keys to highlight a different channel, such as the SCFI station 960, the system responds by tuning to the SCFI station 960 in order to provide the audio and video in the background display 965 of the program currently on the SCFI network. It follows that the program description 930 and the identification 920 of the currently displayed channel also change. If the user wishes not to select that program currently on the SCFI network he can use a control device, such as his remote control, to move to another station such as the USA station 970, and again, the system automatically responds by tuning to that particular station, retrieving the program information to display in the program area 975, and broadcasting the audio and video of the current program on that channel 980.

If the user wishes to select the channel 980, the user indicates selection by depressing the appropriate key on his control device. The system then responds by removing the guide, leaving the audio and video of the tuned station for the user to view. If the user does not select the channel 980 and simply exits the guide, the system returns back to the channel tuned to when the guide was entered, in the present example, the TBS network. Thus the present system provides useful information to the viewer to enable the viewer to easily determine programs to watch without the need to navigate through multiple levels of menus or to continuously switch between menus and broadcasts. This has been briefly illustrated in **Figures 9A, 9B and 9C** and will be described in further detail below.

The discussion will now turn to the general process flow for one embodiment of the present invention. **Figure 10** is an illustrative flow diagram of the functionality provided in one embodiment of the present invention. It is readily apparent to one skilled in the art that additional functions can be added and functions modified or removed and still be within the scope of the invention. The system provides an innovative and user-friendly access to a wealth of information regarding programming available through the broadcasting system. In the present system a number of functions are selectable through the remote control devices such as a joystick or tablet or other means such as an on-screen menu.

Referring to **Figure 10**, a television screen or display is currently showing a broadcast of a selected station 1000. The system monitors the states of the buttons on the user's remote control device to determine when the user has depressed a certain button. Implementa-

tion of monitoring, e.g., polling, interrupt driven events, are well known in the art and will not be discussed further herein.

At step 1005, if the display button is pressed, at step 1010 the channel banner is displayed. This channel banner is superimposed over the displayed broadcast to identify to the user such things as the current station, the program currently played, the start and end time of the program, as well as some additional information such as the current date and time. An exemplary display is shown in **Figure 11**.

Referring back to **Figure 10**, if the menu button is pressed, step 1015, the system retrieves and displays the main menu, step 1020, enabling the user to perform such functions on screen such as viewing different guides or lists, setting system functions, viewing attractions, and purchasing pay-per-view programs. The main menu has items which are arranged in the 3x3 matrix. The center item, shown in **Figure 12A**, is used to exit the menu. Other items enable the user to select guides or program lists. In addition the user can enter the system menu shown in **Figure 12B**, or the user settings menu 1210 shown in **Figure 12C**.

When the user initially enters the main menu 1201 the pointer is currently positioned at the center of the menu 1200 enabling the user to immediately exit the main menu 1201 if inadvertently entered. Once in this menu the user can select an item using the display cursor or highlight keys such as the up arrow and down arrow and right and left arrow keys on the remote controller, or by depressing one of the numeric keys which corresponds to the numeric identifier, e.g., identifier 1215 for the movie guide. This physically corresponds with the arrangement of the actual numeric keys on the remote controller. Furthermore, if an item has a sub-menu this is represented by a corresponding icon such as the icon 1220 for system menu 1250. It should be noted that when these menus are displayed, the menus are displayed superimposed over the current broadcasted station enabling the user to navigate through the menus to enable/disable certain functions or selection while still keeping the broadcast active and displayed in part.

The system menu selected through the main menu of **Figure 12A** is shown in **Figure 12B**. This menu 1250 functions similarly to the main menu through use of the arrow keys or direct selection of items by depressing a particular numeric value from the numeric keypad located on the remote control device. The system menu provides the user access to electronic mail messages through the messages box 1251. The mail icon informs the user that he has unread mail. In response to selection of the messages box 1251, the system provides a list of the user messages as shown in **Figure 12D**. Upon selection of a message to read, the box displays the message as shown in **Figure 12E**. **Figure 12C** is illustrative of the custom setup menu shown in **Figure 12B**, item 1255. Referring to **Figure 12C**, through the custom

setup menu, the user can personalize guides and menus utilized when operating the broadcast system. For example, referring to **Figure 12C**, the custom setup menu 1270 provides options such as the setting of favorite stations 1275, setting default language 1280, setting stations to skip when reviewing stations (skip stations) 1285, and setting locks to stations and limits on viewing 1290. The user also has the option of exiting the entire menu whereby the broadcast is completely displayed on the screen 1295, or going back to the system menu, **Figure 12B**, 1297.

**Figure 12F** is illustrative of the skip stations feature provided to the user. The user simply moves the system pointer to highlight a station, e.g., station 100, and depresses the selection button to select the station. Thereafter, when scanning or "channel surfing" stations, the selected station(s) are skipped. Furthermore, it is preferred that the station guide (**Figure 14A**) does not show skipped stations. In addition, it is preferred that the system provide a custom guide in the format similar to the Master Guide of **Figure 8**, except that channel and program information are only displayed for non-skipped channels. The custom guide is accessed through the "other guides" item in the main menu. The custom guide is shorter because skipped station information is not displayed and unused areas due to the stations skipped are removed from the guide. Furthermore, the custom guide provides information regarding only those channels the user is interested in.

On the main menu an innovative feature referred to herein as "other guides" 1210, enables the user to select a particular category of programs to view on a guide. For example, a selection of the other guides, item 1210 on the main menu 1201, will bring up a display such as shown in **Figure 13A**. **Figure 13A** is an example of categories which may be distinguished. Referring to **Figure 13A**, exemplary categories are movies, sports specials, series, news and shopping. Once a category is selected, a subcategory menu is displayed, an example of which is shown in **Figure 13B**, which displays subcategories related to the selected category, movies. Selection of the "all" button 1305 selects all the subcategories. Otherwise, through manipulation of the pointer, certain categories can be selected. If the user selects certain categories as a preference, those programs that meet the category criteria are displayed more prominently than the remaining programs. The actual locations in the guide remain the same so as to provide the user program information regarding all stations; however by displaying the programs of the selected category/subcategory more prominently, the user can easily focus on the type of programming he prefers.

**Figure 13C** illustrates utilization of the pointer to select categories and subcategories. Referring to **Figure 13C**, at step 1355 the other guides display of the main category is shown. The sports category is pointed to as represented by the highlight. At step 1356, the pointer is moved using the left arrow to the movies category. At

step 1357, the select button is entered to indicate that the movies category is selected. The system responds by displaying the subcategories for movies.

The user then has the opportunity to select all, in which all categories are highlighted as shown in the display of step 1357, or the user can select one or multiple subcategories as shown in display of step 1358 in which the Comedy Guide is shown. The down arrow key is then used to move to the Fantasy Guide, step 1359. The user then depresses the select button to show that the fantasy Guide has been selected, step 1360. The right arrow button then moves the display pointer to the OK button where the user can select again to indicate that his selection is complete, 1361. At this point a guide or list of programs meeting that criteria is displayed, step 1362. This display preferably includes all programming for the channels but highlights those that meet the selection criteria of the user. The advantage to this is that the user is provided the category of programs he selected but is still provided information regarding other programming. The guide then permits the user to move from the station to station that meet the selected categories, to enable the user to select the programming desired.

Referring back to **Figure 10**, if the select button is pressed, the system responds by providing the station index, step 30. An example of a station index is shown in **Figure 14A**. The station index provides a simple but effective way to give the user the information regarding available stations and the ability to easily preview stations without specifically moving sequentially through each channel number. The icon provides a visual means by which the user can associate the station in order to determine which stations he wishes to preview and possibly select for viewing. Thus, using the station index 1400 and moving the system pointer, in the present illustration by using up, down, right, and left arrow keys to highlight a particular box surrounding a station icon, the user can preview the audio and video currently broadcasted to determine whether it is desirable to select that station and view.

When the user moves the system pointer to a box surrounding a different station logo and channel number than that currently tuned to and displayed on the screen, the system responds to the movement of the pointer by tuning to the channel, outputting the audio through the television speakers and displaying the video beneath the station guide such that user gets an idea of the current program on that channel. If the user wishes to exit the station index, the tuned signal that is currently displayed is removed and the system tunes back to the channel the system was tuned to at the time the station index was selected. Thus, the user can scan programs on a channel by channel basis and simply exit if he finds nothing of interest to view. However, if the user finds a station he wishes to view, he simply depresses the select button (for example, the center button of the arrow keys of the remote) and the station index display

is removed, thus leaving the display of the entire video of the broadcast (in addition to the audio which is always present even when the station index was displayed).

The number of stations which are selectable is so great that to display on one screen would be quite difficult. Therefore, in the system a table is generated in memory containing the station information such as the icon and channel number. The scroll bar 1405 is used to tell the user where in the table of stations the currently displayed stations are located. This gives the user perspective of where in the table of stations he is currently located. **Figure 14B** illustrates the process of scrolling among the stations. At step 1450, the user has located a determined location 1465 in the table 1470. Selection of the down arrow key causes a scroll up function to occur, step 1455. Similarly, the depression again of the down arrow key, step 1460, causes another scroll up function to occur, in this case displaying the bottom three rows of stations and the top rows of stations as the table can be scrolled in a continuous manner.

**Figure 14C** illustrates the selection of a station using the station index. At step 1475 the display includes the video and audio of the station the pointer is currently located at, station 1476, and the station index which is placed over the video 1477. In this example, the right arrow key is depressed which moves the pointer station to the station immediately to the right of the previous station 1476 to station 1477. The system responds by tuning the system to the station 1477 and displaying the audio and video for that station at step 1480. The user in this instance depresses the select button 1481 and the system responds at step 1485 by removing the station index and leaving the selected audio and video for the user to view. The capability to preview broadcasted stations before exiting the actual program selection menus or guides is also provided with respect to the electronic programming guide (EPG).

Referring to **Figure 10**, at step 1035 if the guide button is depressed, the electronic programming guide is entered. An example of the electronic programming guide is shown in **Figure 15**. The electronic programming guide provides such information as the call signs for the stations 1510, the broadcast system station number 1511, the currently tuned station 1512, including the station logo 1513, and the time the currently tuned program is broadcasted 1514. The stations are arranged on an XY matrix according to broadcast station number 1511 and time of broadcast 1515.

For each period of time a particular program is broadcasted on a particular station there is typically provided a program title. However, prior art systems do not provide any further information regarding the program. In order for the user to preview the program the user has to select the program to view, thereby exiting the guide. In order to get further descriptive information regarding the program, the user is required to select an info button to enter into another level of menus to get the information regarding program description. However, in the

present arrangement the system tunes to the station that the pointer is located at and provides the video and audio in the areas of the display not covered by the guide. Furthermore, the system retrieves program description and displays it in a special program name, block 1520, giving the user both a verbal description of the program and a preview of the actual broadcast of the program.

If the user wishes to move the pointer to a different station, the system, again, automatically tunes to the station the pointer is located at, providing the audio and video in the background and further retrieves the program information to provide the description of the program currently broadcasted. The user can preview many different stations without entering and exiting the guide repeatedly.

The present embodiment further provides the capability to relay reserved program information to the user. For example, this may be utilized if the user prepays for a pay-per-view program. That time is considered reserved as it is paid for by the user. Furthermore, the user is able to view on the display prior reserved programs. In the present embodiment, the programming time bar 1515 of the electronic programming guide is highlighted or shaded at the times during which there is reserved programming to produce a reserve time bar 1530. The reserve time bar 1530 functions as a reminder to the user that he has reserved time to view a pay-per-view program thus eliminating duplicate purchases or minimizing forgetfulness of reserved programming.

Referring back to **Figure 10**, an innovative way for a user to view favorite stations in the same guides that enables a user to view programming on other stations is provided. When the user is in a certain index or guide and depresses the favorite button on the controller device, the index or guide is modified to display at the beginning of the index or guide the favorite stations as selected by the user. For example, referring to **Figure 10**, at step 1045, if the favorite button is pressed, the station index is modified to display the favorite stations at the beginning of the station index. Similarly, at step 1055, when the favorite button is depressed, the display of the guide is modified to show the programming of the favorite stations at the beginning of the guide, step 1060.

**Figure 16A**, for example, is illustrative of the station index and the display of the favorite stations on the top row of the station index. Similarly, **Figure 16B** shows the general guide and the top seven rows of the general guide display the top seven stations as indicated by the favorite stations. The system preferably provides for a multiple user's favorite stations. For example, in the present illustration, three users can designate their favorite stations or one user may have three separate sets of favorite stations. In the present embodiment, the favorite stations can be switched from one user's set of favorite stations to another user's set of favorite stations by successive depression of the favorite button on the remote controller. It is readily apparent that other meth-

ods can also be used. **Figure 16C** is a block diagram illustration of still another display of favorite stations referred to as the favorite station guide. This is entered through the main menu and will now be described in detail with reference to **Figure 17**.

Referring to **Figure 17**, included in the favorite station guide is a wealth of information that enables the user to determine at this display information regarding the programs currently broadcast on the favorite stations. The favorite station guide is entered in through the main menu. When selected, the favorite station guide will show in the background the currently tuned station and the audio of the currently tuned station. When entering the guide, the exit to current station box 1705 is displayed as highlighted, enabling the user to immediately return by the program he was viewing at the time he entered the guide. Thus, the user has access to seven favorite stations. Each box includes the channel logo and channel number 1708-1710, and the programming currently broadcasted on those stations 1712.

The user can use the system pointer to move among the favorite stations. The system in response to the movement of the pointer will tune the system to the station the pointer is currently located at. If the user finds a channel he wishes to view after previewing using the favorite station guide, the user simply selects the station, automatically exiting the station guide, and the system responds by removing the display of his favorite station guide leaving the entire tuned video image. If the user does not wish to view any of the programs listed in the favorite station guide, the pointer is moved to the previous box and selected. The system responds by exiting the favorite station guide and also automatically tuning back to the station the system was tuned to prior to entering the guide. Thus, the user can easily scan programming on his favorite stations and either select one of these to view or go back to the station he was viewing at the time the guide was entered.

**Figures 18A and 18B** illustrate the menus for setting up the user favorite stations. This is entered into through the custom setup menu. Once this is selected, the display, an example of which is shown in **Figure 18A**, is generated. The user can then modify or setup stations to be included in his favorite stations. The favorite stations currently programmed in will be displayed for each user on this menu. The user can then select a particular user set of favorite stations and the set favorite station menu, an example of which is shown in **Figure 18B**, will be displayed.

Referring to **Figure 18B**, The upper portion of the menu 1850 displays the current settings of favorite stations. The lower part 1860 shows all possible stations which the user can select to update the current favorite station list. The scroll bar indicates to the user where in the table of stations the currently displayed stations are located 1865. The user has two methods to update favorite stations. The box highlighted in the favorite stations is currently selected 1850 and identifies the box

that can be modified at this point. The user can then change the station noted in that favorite station box by entering in the channel number directly using the numeric key pad on the remote control, or by moving the pointer to the station shown on the display 1860. For example, by entering in the down arrow key the user will move from the box 1863 down to the grouping 1860 where selection of a replacement favorite station can be performed. When a select button is depressed the station currently noted by the pointer will replace the favorite station 1863. This method provides a graphic presentation for users to easily identify stations by their logos to select favorite stations to utilize in the selection of programs to view.

In today's broadcast systems additional information such as categories of program, for example sports, movies and comedy, are provided with the transmissions of the actual broadcast. The term "channel surfing" is quite well known. When channel surfing, a viewer or user is simply using his channel "+" or "-" keys to move or surf sequentially from channel to channel in ascending numeric order or descending numeric order. In the present system, however, this technique of channel surfing is somewhat modified. This is explained with reference to the flowchart of **Figure 19**.

Referring to **Figure 19**, at step 1900, the system is currently tuned to a station broadcasting the current programming. This may be, for example, a sports program. The user may want to see what other sports programs are provided. Certain buttons on the remote may then be responsive to the user's desire to see other sports programs. These other programs may be selected through the guides and menus described previously; however, in the present embodiment, the user can utilize the pointer keys used for electronic guide keys, e.g., the pointer direction keys, to indicate to the system that the user wishes to simply channel surf among all sports programs in accordance with the direction indicated by the button depressed. Thus, if one of the arrow keys is depressed at step 1905 the system will take the determined category of the programming, step 1910, and then use the category indication to find another station having the same category of programming, step 1915, and tune to that station. The user can repeatedly perform this process until he finds a station that he wishes to view, enters in a menu or guide, or exits the system, step 1920. Thus, the guide arrow keys which are not used when the guide is not displayed on the screen, as opposed to the channel arrow keys, may provide a dual function for those viewers who wish to simply move from station to station having a certain type of programming.

Other variations are also contemplated. For example, if the control device includes 4 direction keys, right, left, up, down, the system responds to the up and down keys to perform sequential channel to channel tuning. The user uses the right and left direction keys to perform category channel to channel tuning. Additional functionality includes utilizing the electronic programming guide

select key on the control device to display information regarding the currently tuned channel. This information may simply be a channel banner superimposed over the broadcast containing such information as the title of the program, start and end times, and program description. Multiple displays containing additional information may be generated and displayed by repetitive depression of the select key. The user, in this embodiment, is able to tune to channels and gather basic information regarding the channel and current programming on the channel without the use of the electronic programming guide.

In an alternate embodiment, information downloaded from the satellite is used to generate program information according to categories of programs. **Figure 20** illustrates the format of a program list. Referring to **Figure 20**, the program list will identify programs of a selected category, for example, movies, and list them according to title 2825 in a determined order, for example, in alphabetical order. Adjacent to each program title 2825 are blocks 2820, that identify each time in the displayed time period identified by the time line 2810. This is quite advantageous for determining available programming according to program content as opposed to channels the program is broadcasted on. For example, a recent movie provided by a pay-per-view service may be broadcasted upwards of 15 times a day on multiple channels. Using the program list, the user is able to see in one line of the easy to view display the start times of the movie for the displayed time period. If more than one channel is to broadcast the same program and the start times overlap the identified time period increments, for example, 1/2 hour increments, the start time indicator will reflect the time periods such as start time indicator 2830.

**Figure 21** is a simple flow diagram illustrating an exemplary process for displaying the program guide. At step 2910, the category is selected. In the present embodiment, a category selection menu is selected through the main menu accessed by depressing the "menu" button on the remote controller or front panel display. An example of the main menu is shown in **Figure 23**.

In the embodiment shown in **Figure 23**, the main menu enables the user to perform such functions on screen such as viewing different guides or lists, setting system functions, viewing attractions, and purchasing pay-per-view programs. The main menu has items which are arranged in the 3x3 matrix. The center item 2310 is used to exit the menu. Other items include a system menu 2315 which includes certain system functions as well as a submenu to access certain user specific settings. The main menu further provides entry into submenus that provide programming in a guide or channel oriented format, 2320, 2325, 2330 and 2335. Items 2340, 2345 provide access to program lists. In particular, the present main menu includes a "Movie List" 2345 as this type of program list is frequently requested by a user. However, the user may select to view program lists

of other categories of programming. The user can select the categories through the "Select Lists" item 2340 in the main menu.

When the user initially enters the main menu, the pointer is currently positioned at the center of the menu 2300 enabling the user to immediately exit the main menu 2401 if inadvertently entered. Once in this menu the user can select an item using the display cursor or highlight keys such as the up arrow and down arrow and right and left arrow keys on the remote controller, or by depressing one of the numeric keys which corresponds to the numeric identifier. This physically corresponds with the arrangement of the actual numeric keys on the remote controller. It should be noted that when these menus are displayed, the menus are displayed superimposed over the current broadcasted station enabling the user to navigate through the menus to enable/disable certain functions or selection while still keeping the broadcast active and displayed in part.

When the user wishes to view of program list of a particular category of programming, the "Select Lists" 2340 item is selected bringing up the category list as shown in **Figure 24**. It is readily apparent that the categories shown are illustrative and that other categories may be used. In the present illustration the user has selected the category "Specials", as denoted by the check mark 2410 shown. Although only one category is shown here, it is apparent that multiple categories can be selected by placing the pointer over the appropriate category box and indicating selection (for example, by depressing the select key).

After the user has selected a category, a subcategory screen is displayed to enable the user to further define the programs the user is interested in. An example of a sub-category display for the "specials" category is shown in **Figure 25**. It is readily apparent that the subcategories are in part category dependent. Therefore, depending upon the category selected, the subcategories may change. The user can select all or some of the subcategories. In the present illustration, the user has selected all the subcategories.

Referring back to **Figure 21**, once the user has selected the categories, the system responds by searching the program data to find those programs that are defined in that category, step 920. In the present broadcasting system, the category information is provided by the service as part of the programming information (see **Figure 6**). However, it is readily apparent that the category information may be provided by other means.

Once the programs meeting the category criteria have been identified, the programs are sorted, step 2930, to present the programs in a logical manner to the user. Preferably, the programs are sorted alphabetically according to program title. Duplicate titles, for example, entries representing a pay-per-view special that starts every 1/2 hour on several different channels, are condensed, step 2940, into one entry which reflects multiple start times. The system then generates the program list



display and displays the list generated, step 2950, to the user.

Once the program list is displayed, the user can view in a clear informative format program descriptions, categories/subcategories and channels which broadcast a particular program at a particular time. Furthermore, the user can purchase pay-per-view programming and select currently broadcasted programming to view.

An example of a program list display is shown in **Figure 26**. The program list includes a list of programs 2605, sorted alphabetically, that meet the category criteria and the times the programs occur. The times the programs are to be broadcasted are identified by the time bars 2610, 2615, 2620. Programs currently broadcasted are identified by the left arrows 2625, 2630.

The user can manipulate the system pointer to review information regarding a particular program or occurrence of a particular program. In the present embodiment, the pointer is reflected by a highlighted area of the display. However, other types of pointers, such as an arrow superimposed on the display at the location of the pointer, can be used. An exemplary user interface process to the program list is illustrated by the flow diagram of **Figure 22**.

Referring to **Figure 22**, once the program list is displayed, step 2210, the system monitors the movement of the system pointer, step 2215, as is indicated by depressing the menu up, down, right, left keys on the remote or front panel, or by movement of a joystick or similar pointer control device. When the pointer is moved to point to a different program, the system responds by retrieving the program information and displaying the program information, step 2220, in the program data area (2645, **Figure 26**). In addition, referring to **Figure 26**, the system displays subcategory of the program 2653, the channel the program will be broadcasted on 2650, channel logo 2655, time of broadcast 2657 and program rating 2659.

In the present embodiment, movement of the pointer to the position of a particular start time block, e.g., 2610, will provide the program description 2645 of the corresponding program and the channel information 2650, 2655 and complete program time information 2657 for the particular broadcast. In alternate embodiments, the user can also move the pointer to point to the program title 2605. In this instance a default standard is used to generate the channel and program time information. For example, information regarding the current or next broadcast of the program is displayed.

This program list is superimposed on the broadcast of a channel if the system pointer is located at the location of a currently broadcasted program. Thus, the user not only is provided the program information, but is also provided the audio and video 2665 of the broadcasted program, all on the same menu level of the program list. By movement of the system pointer (in the present example, by manipulation of the information highlighted),

the system will automatically tune to a channel if the program identified by the program list is currently broadcasted, enabling the user to stay in the menu while still previewing in part the broadcasted channel. Therefore, referring back to **Figure 22**, if the pointer is pointing to a currently broadcasted program, step 2225, the system tunes to the channel providing the broadcast, step 2230. The user then has the opportunity to select the program to view, step 2235. If the user selects a program to view, for example, by depressing the select button on the remote control device, the system will exit the program list, step 2240, providing the user unobstructed video of the selected program.

As noted above, the program list provides the user easy way to purchase pay-per-view programming. At step 2245, if the user moves the pointer to a program start time of a pay-per-view program, the system responds by providing a purchase menu. An example of a purchase menu is shown in **Figure 27A**. Using the purchase menu, the user can select to purchase the program in advance or at the time of broadcast. Referring to **Figure 27A**, if the user wishes to see a listing of other broadcast times for the selected program he selects the "Times" button 2705. The system responds by providing a listing of other times as shown in **Figure 27B**. Selecting a particular time, as evidenced by the check mark 2710, and selecting OK, enables the user to purchase the program to view.

Referring back to **Figure 22**, once the user is finished reviewing the program list, he exits the list, (e.g., **Figure 26**) step 2255 and is returned back to the broadcast he was viewing prior to entering the program list. If the user wishes to view the programming in a different timeframe than that identified by the time bar 2670, the user moves the system pointer to the time bar and uses the pointer to move the pointer to the extreme left or right of the time bar, thereby causing the time bar to scroll in the corresponding direction. The system responds by extracting the programs of the selected category which have broadcasts in the timeframe displayed, sorting the programs and updating the display.

The invention has been described in conjunction with the preferred embodiment. It is evident that numerous alternatives, modifications, variations, and uses will be apparent to those skilled in the art in light of the foregoing description.

## Claims


1. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for generating an on-screen guide for a user to select channels to view, comprising the steps of:

selecting at least one channel as the user's favorite channel;



- generating an electronic program guide identifying channels in the broadcasting system, said favorite channel displayed at the beginning of the electronic program guide  
wherein the user can easily view information regarding the user's favorite channel. 5
2. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for generating an on-screen program list to inform the user of programs available through the broadcasting system, said method comprising the steps of: 10
- selecting a category of programs; 15  
searching for programs occurring during a predetermined timeframe that are categorized as the selected category;  
extracting program information comprising the title and start time of the program; and 20  
generating an electronic program list on a display of the broadcasting system comprising the steps of:  
identifying each program of the selected category by the program title; and 25  
adjacent to each program title, identifying each start time of the program;  
wherein a user can easily view by program category and start times such that multiple occurrences of the same program during the predetermined timeframe are viewable in one program list. 30
3. The method as set forth in claim 2, wherein the step of generating an electronic program list further comprises the steps of: 35
- displaying a time bar along a horizontal axis identifying time increments in the predetermined timeframe; 40  
displaying each program title on a row along a vertical axis; and  
said step of identifying each start time of the program comprises the step of providing a start marker in the same row as the program title and in a column, identified by the time bar, corresponding to the start time of the program. 45
4. A multiple channel broadcasting system comprising: 50
- a screen for displaying video of broadcasts of programs;  
an input device for inputting a selected category of programs; 55  
a processor for processing program information, said processor identifying programs occurring during a predetermined timeframe
- which are categorized as the selected category and extracting program information comprising a title and start time of each identified program; and  
an on-screen electronic program list identifying programs of the selected category which are broadcasted during the predetermined time-frame comprising: 60
- a list of the program titles of the programs categorized as the selected category; and adjacent to each program title, each start time of the program; 65
- wherein a user can easily view by program category and start times such that multiple occurrences of the same program during the predetermined timeframe are viewable in one program list. 70
5. The system as set forth in claim 4, wherein each program is further identified by a sub-category, said system further comprising a sub-category menu comprising a list of sub-categories displayed on the screen, said user operating the control device to select sub-categories, wherein the program list comprises programs that are categorized by the selected category and sub-category. 75
6. The system as set forth in claim 4, further comprising: 80
- a receiver for receiving broadcasting data, said receiver comprising a tuner for tuning a selected channel;  
at least one speaker for outputting audio of broadcasts of programs; and  
said on-screen electronic program list being superimposed over a portion of video of a broadcast on a channel tuned to by the tuner such that the audio is output through the speakers and only the portion of the video of the broadcast is covered by the electronic program list; wherein the user can view the electronic program list while still receiving the audio and a portion of the video of the broadcast. 85
7. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for generating an on-screen guide for a user to select channels to view, comprising the steps of: 90
- tuning to a first channel to provide a broadcast of a first program on the screen;  
generating an electronic program guide identifying channels in the broadcasting system; and superimposing the electronic program guide 95

- over the broadcast on the screen, such that only a portion of the video of the broadcast is covered by the electronic program guide; wherein the user can view the electronic program guide while still receiving the audio and a portion of the video of the broadcast.
8. The method as set forth in claim 7, further comprising the steps of:
- said user using a control device comprising a numeric keypad to indicate selection of a menu enabling the user to operate different functions of the system;
- said system replacing the electronic program guide with a menu comprising nine elements arranged in a 3x3 matrix, said matrix corresponding to a 3x3 matrix of the numeric keypad on the control device, each of said nine elements identifying different functions of the system;
- wherein the user can easily select different functions of the system.
9. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for generating an on-screen guide for a user to select channels to view, comprising the steps of:
- displaying a time bar identifying times of programming on the channels in the broadcasting system; and
- said user reserving future programming at selected times to view; and
- highlighting on the time bar those times reserved by the user.
10. In a multiple channel broadcasting system in which programs are broadcasted for display on a screen, a method for viewing programming on different channels comprising the steps of:
- broadcasting a first program on a first channel, said first program of a first category of programs;
- using a control device, said user using direction control means to move to another channel broadcasting a program of the first category;
- said system responding to the direction control means to tune to the channel broadcasting the program of the first category;
- wherein the user can view successive channels broadcasting the same category of programming without using the electronic program guide.
11. A multiple channel broadcasting system comprising:
- a receiver for receiving broadcasting data, said receiver comprising a tuner for tuning a selected channel;
- a screen for displaying video of broadcasts of programs;
- at least one speaker for outputting audio of broadcasts of programs; and
- an on-screen electronic program guide identifying channels in the broadcast system, said on-screen electronic program guide superimposed over a portion of video of a broadcast on a channel tuned to by the tuner such that the audio is output through the speakers and only the portion of the video of the broadcast is covered by the electronic program guide;
- wherein the user can view the electronic program guide while still receiving the audio and a portion of the video of the broadcast.
12. A multiple channel broadcasting system comprising:
- an electronic program guide comprising channels and programs on each channel, each program is identified by a category, said programs that are identified to be a selected category are highlighted;
- wherein all programming can be viewed and the selected the category of programs is highlighted for easy viewing by the user.
13. A multiple channel broadcasting system comprising:
- a receiver for receiving broadcasting data, said receiver comprising a tuner for tuning a selected channel;
- a screen for display of broadcasts of programs, said screen displaying a first program broadcasted on a first channel, said first program of a first category;
- a user control device comprising a direction control means to move to another channel broadcasting a program of the first category;
- said system responding to the direction control means to tune to the channel broadcasting the program of the first category;
- wherein the user can view successive channels broadcasting the same category of programming without using the electronic program guide.

Movies Guide					Thurs 12/16/94 1:54PM			
12:30PM		1:00PM		1:30PM		2:00PM		
OTV 149	Seduce Me: Pamela Principle 2					Seduce Me: Pamela Pr...		
MTV 150	Top Rap Videos		Music of the '70s					
C TV 151	Cooking with Linus		Comedy Club					
OTV 154	The Ref				The Ref			
OTV 155	Star Trek		The Chase					
STV 156	Wildlife Safari				Ancient Civilizations			
	Themes		Sports		Other		All	Exit

**FIG. 1**  
(PRIOR ART)

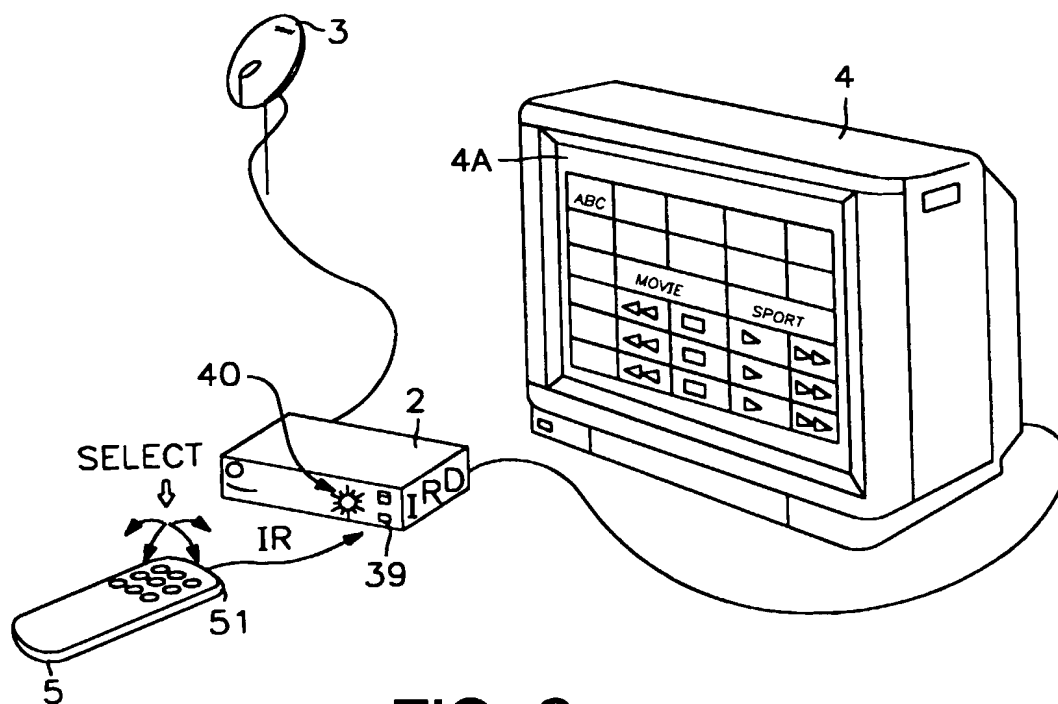


FIG. 2

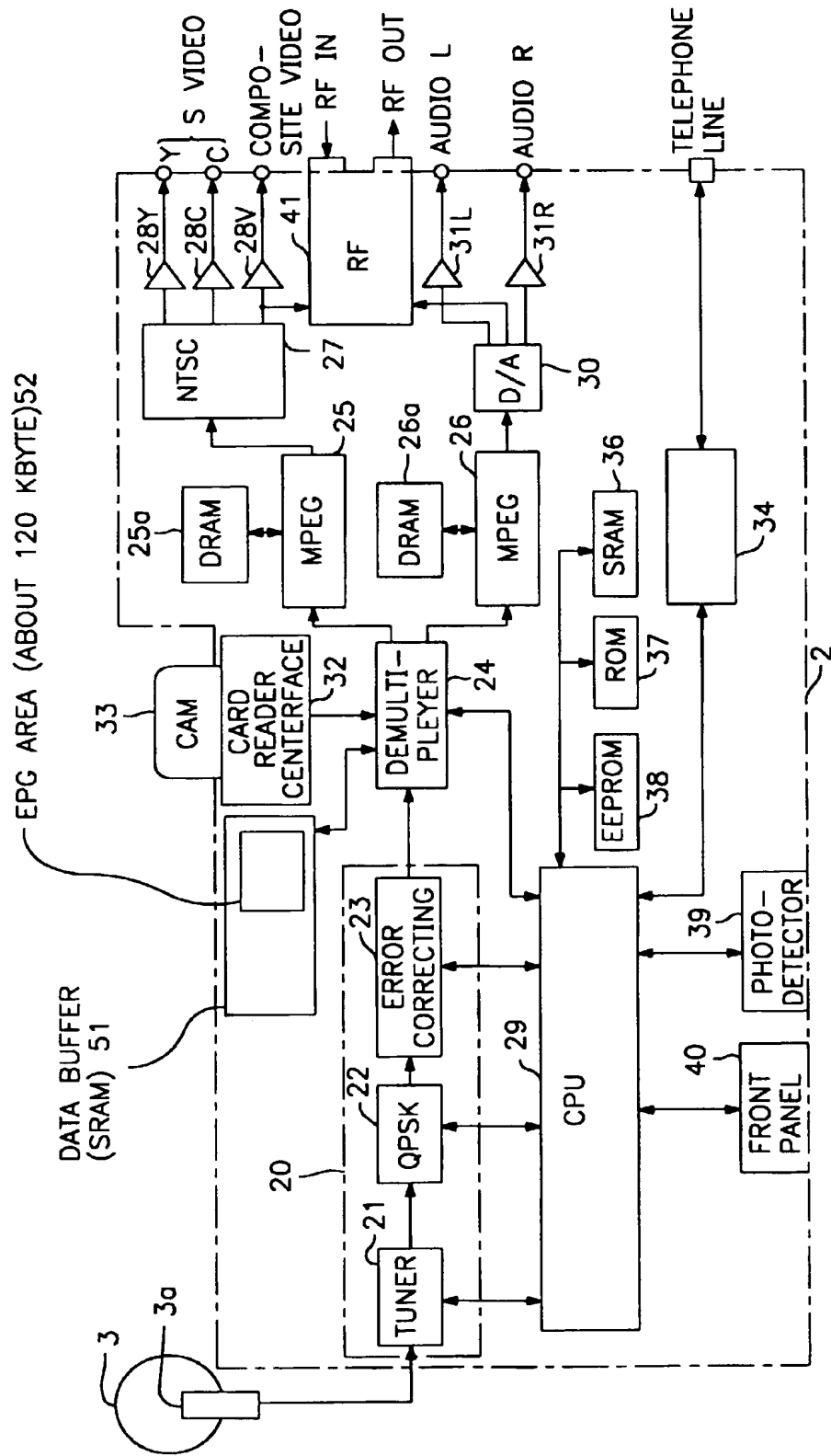


FIG. 3

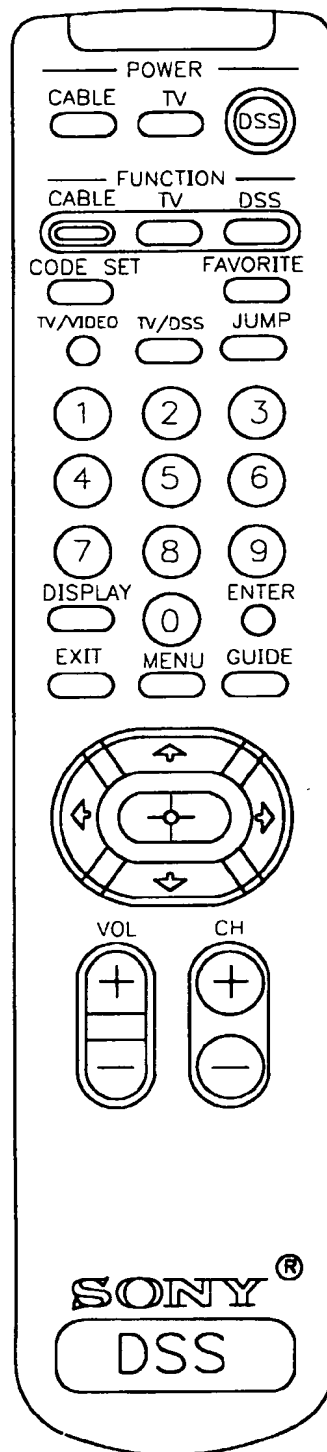


FIG. 4

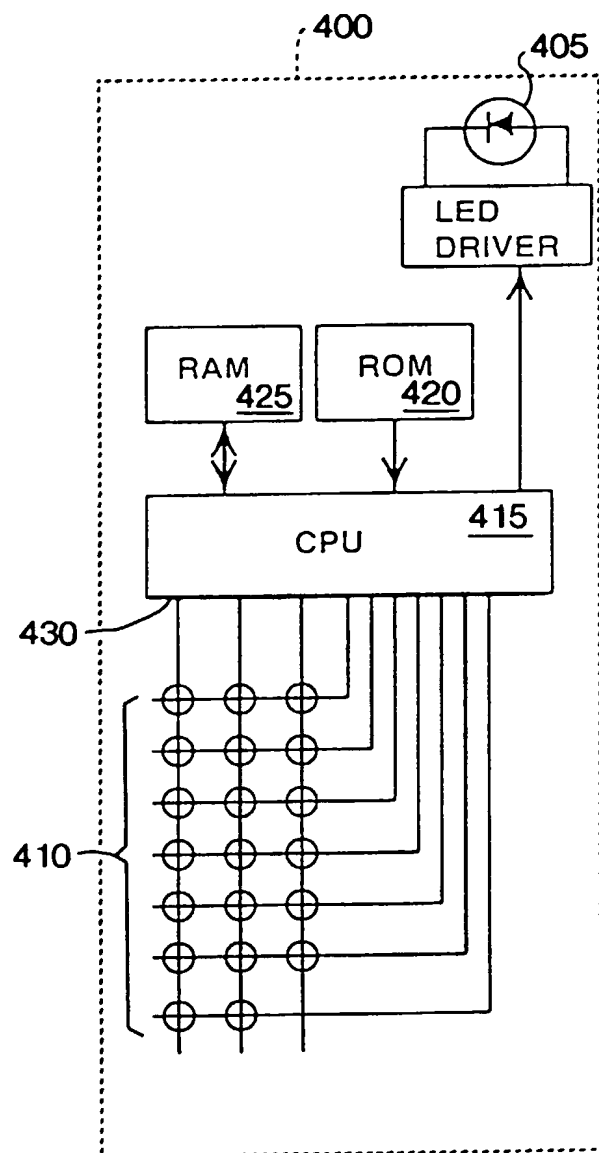


FIG. 5

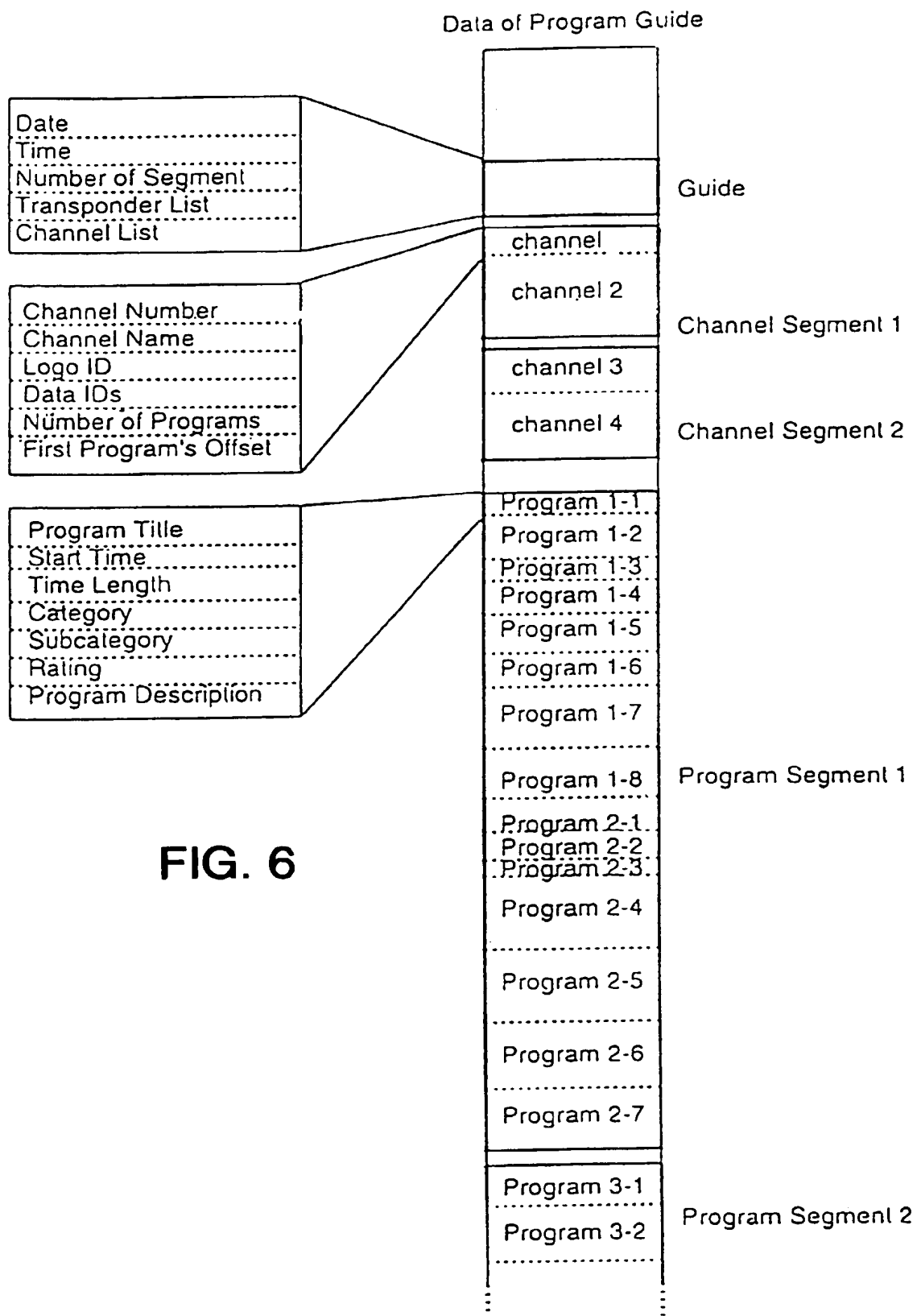
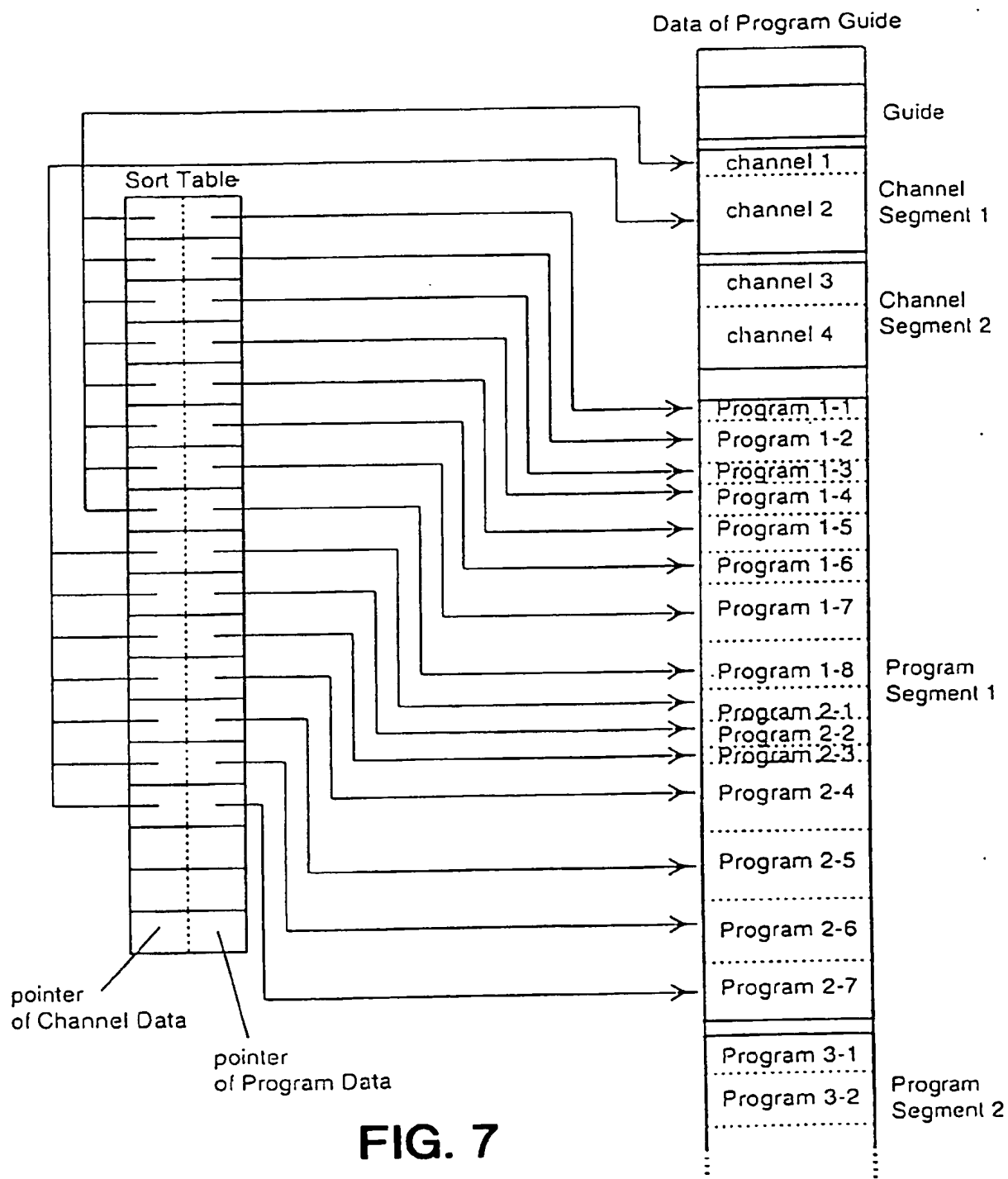


FIG. 6





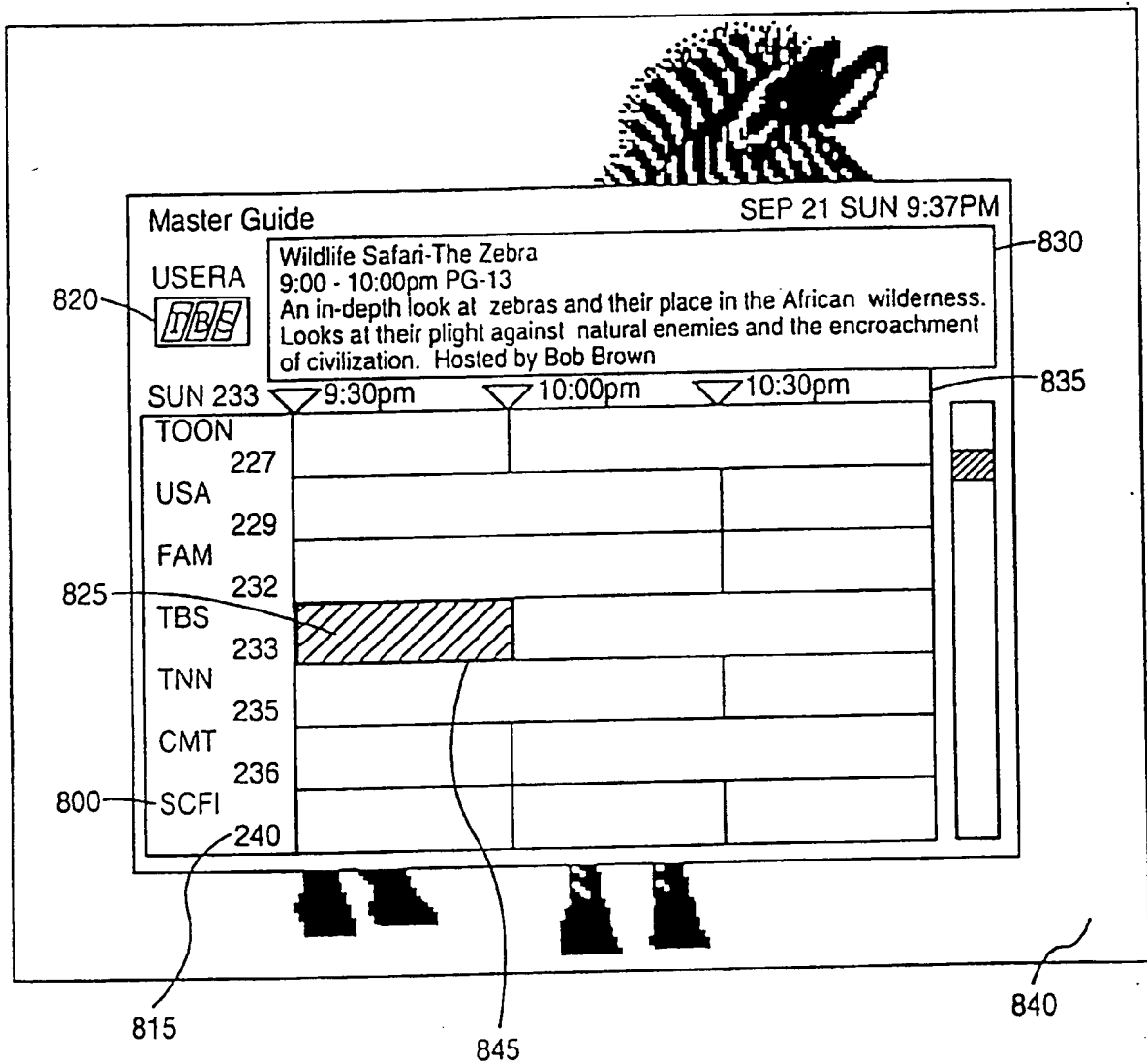


FIG. 8

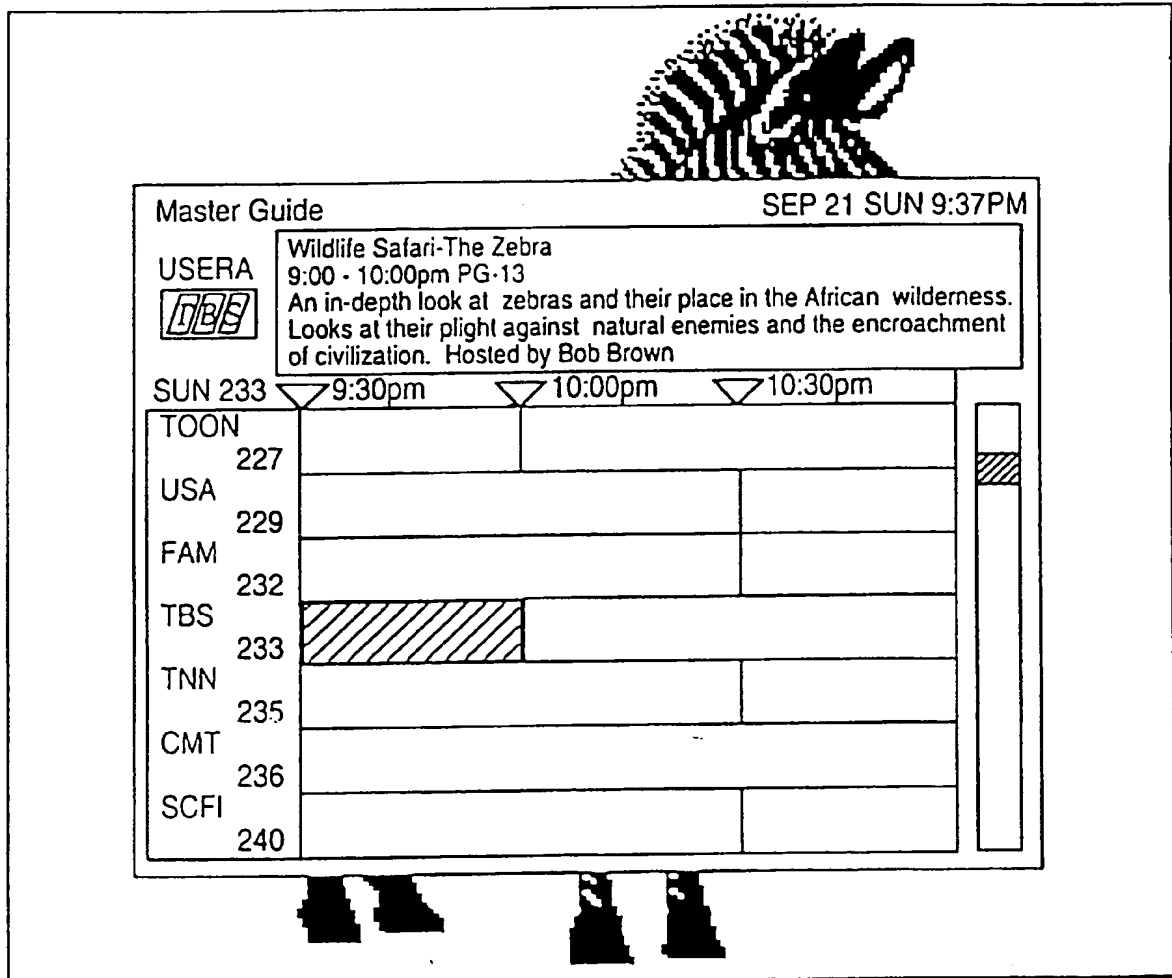


FIG. 9A

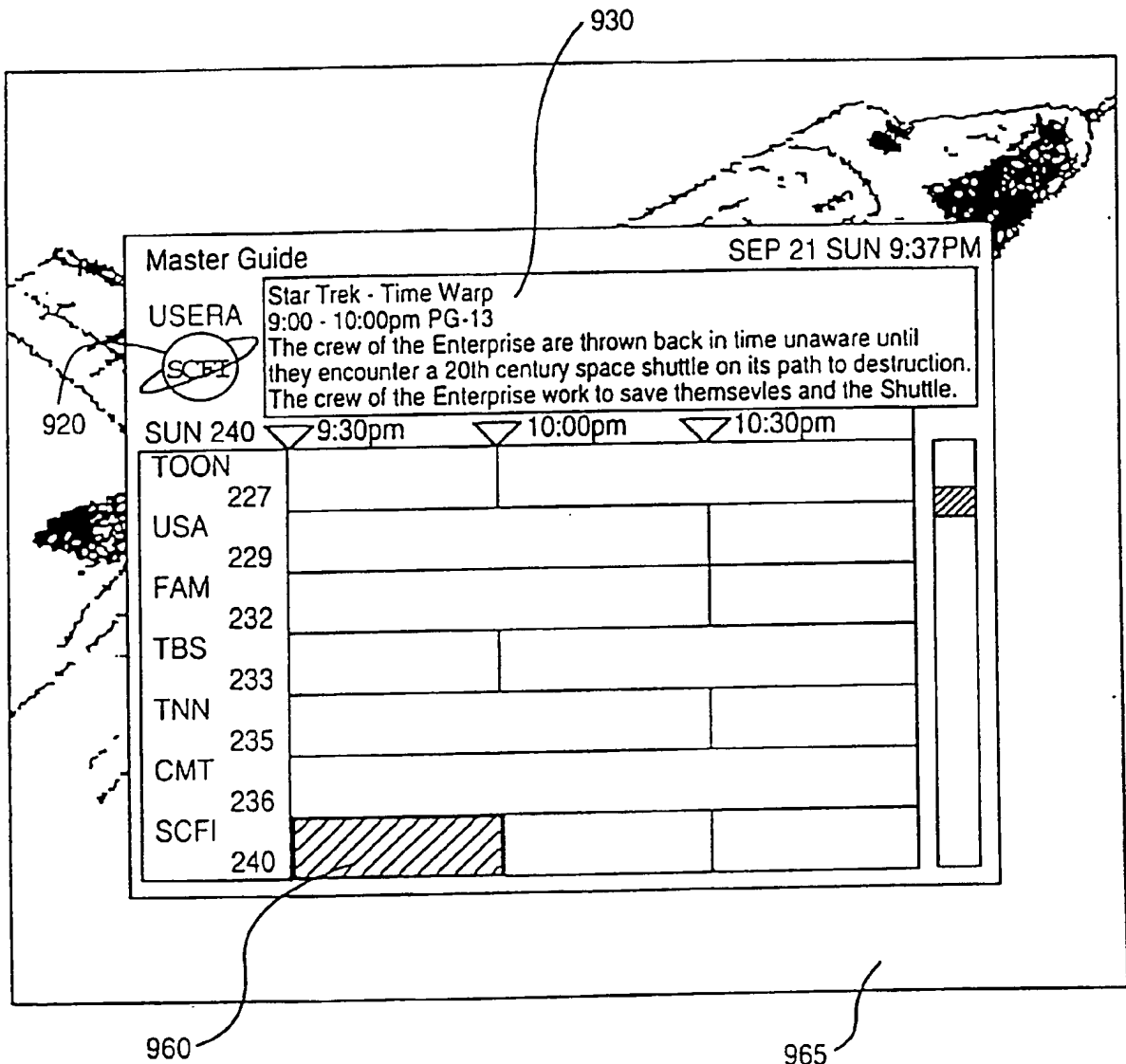


FIG. 9B

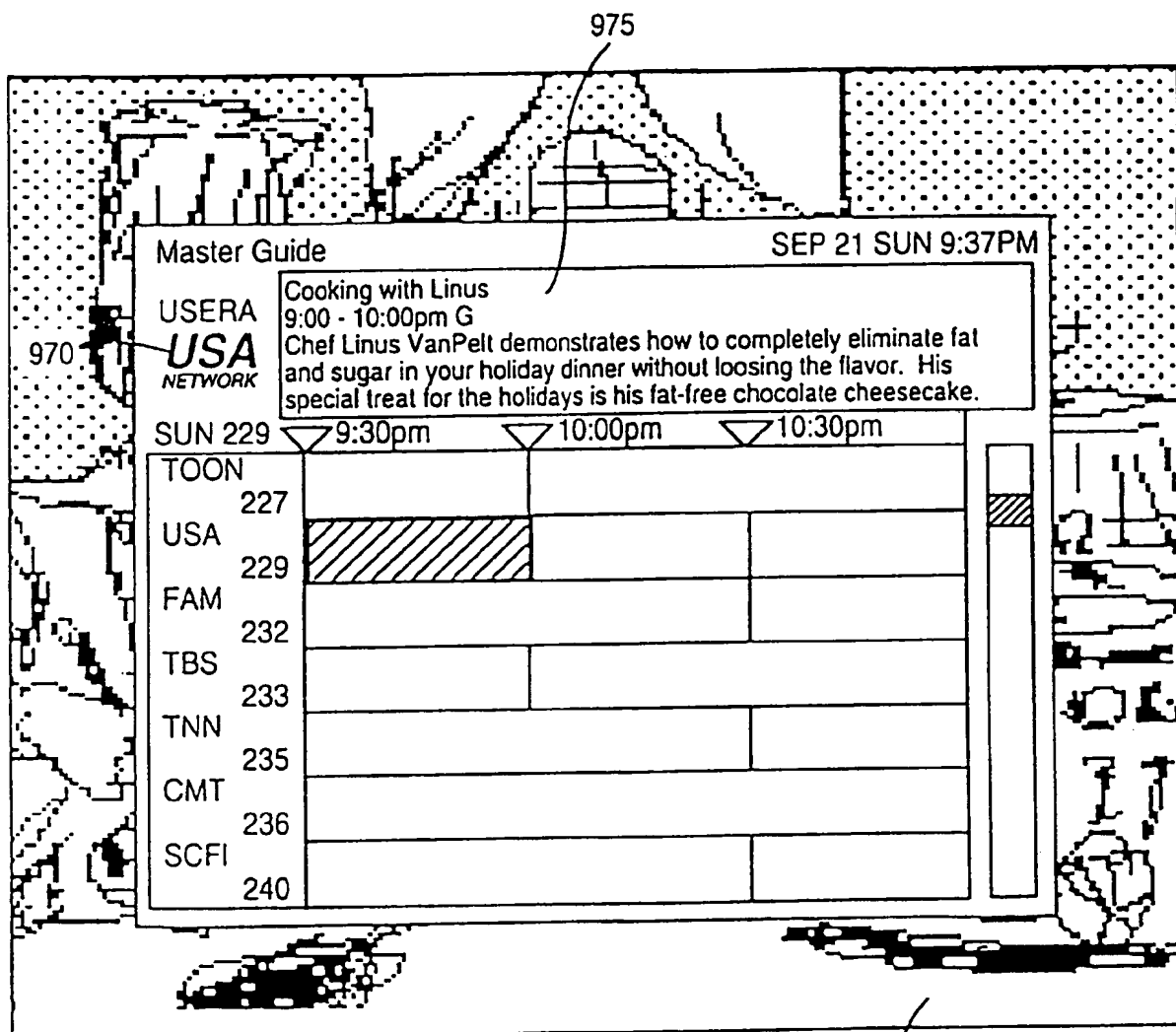


FIG. 9C

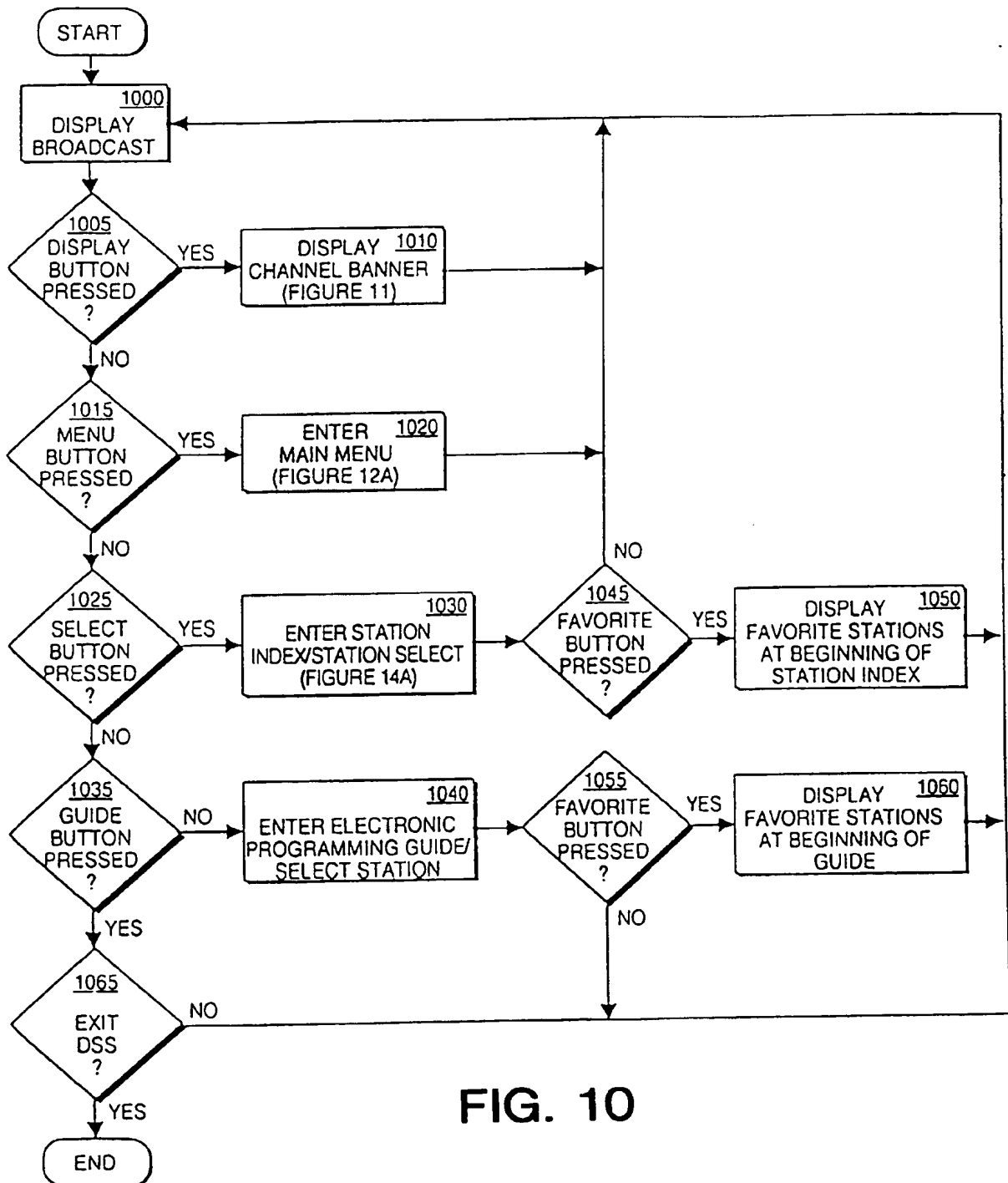


FIG. 10

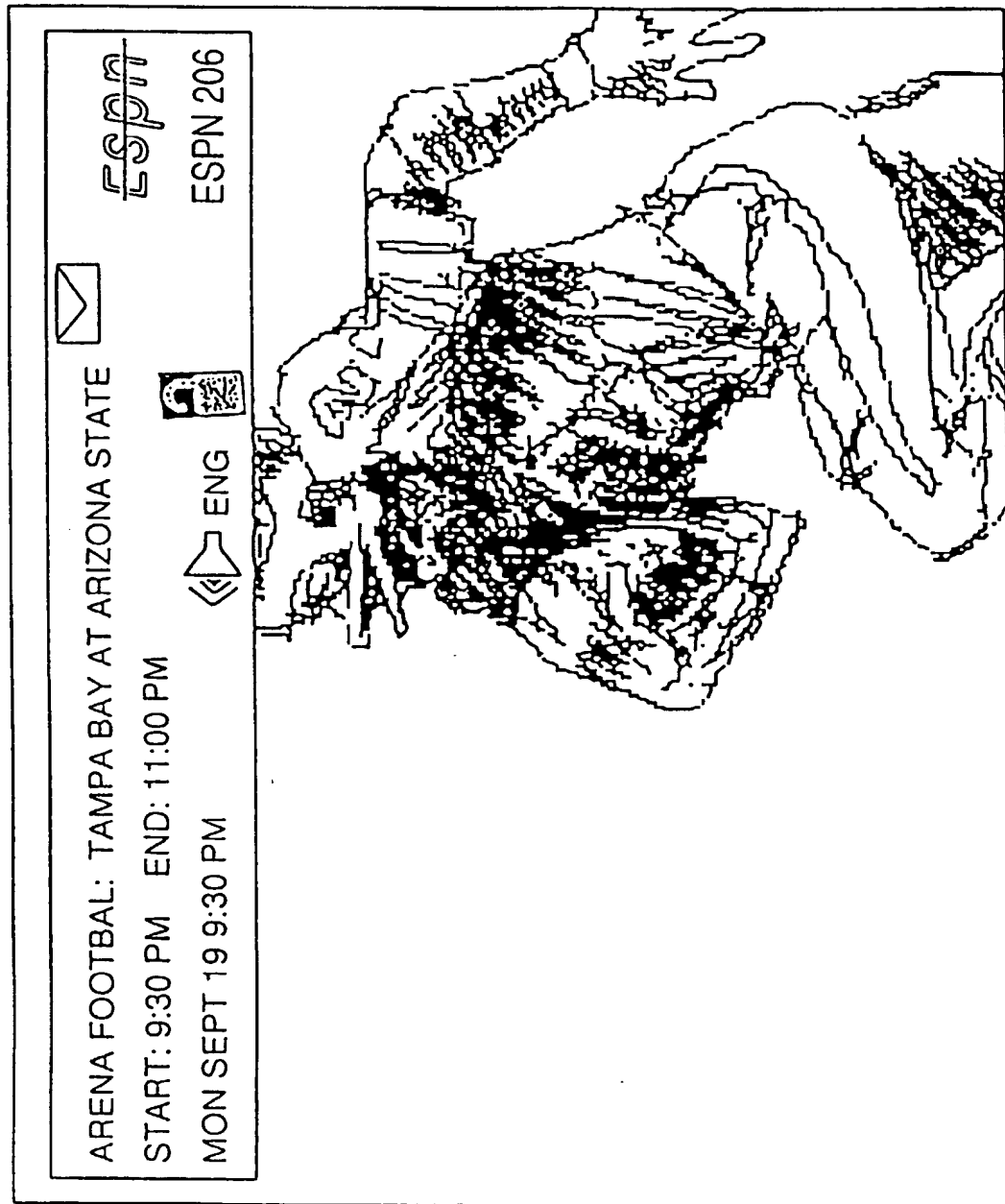


FIG. 11

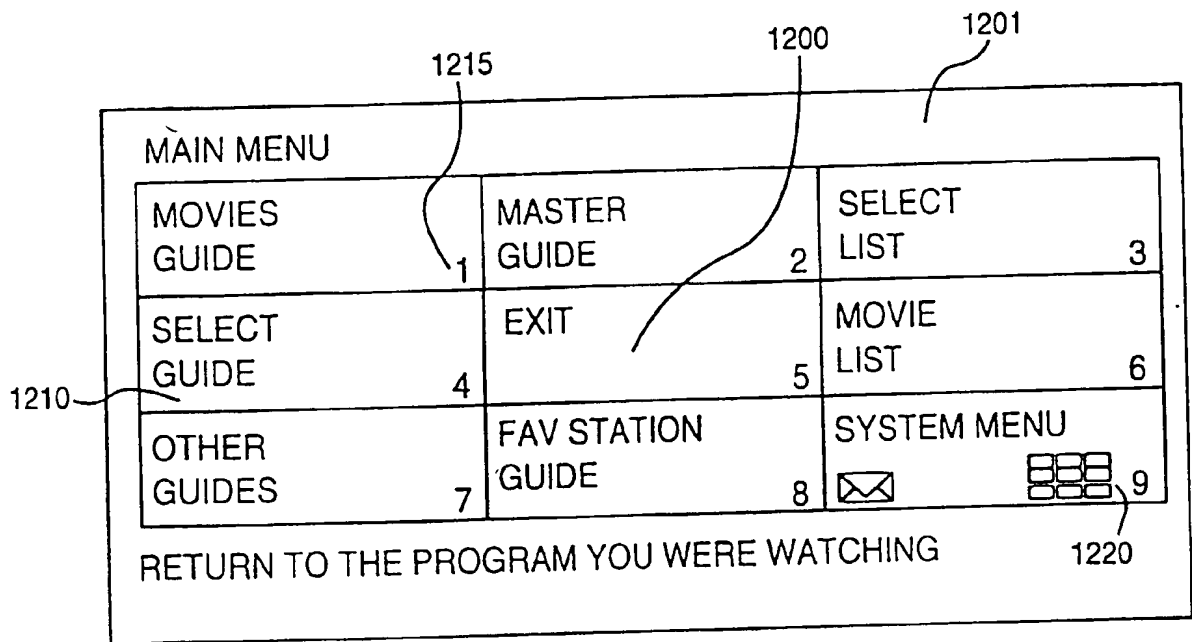


FIG. 12A

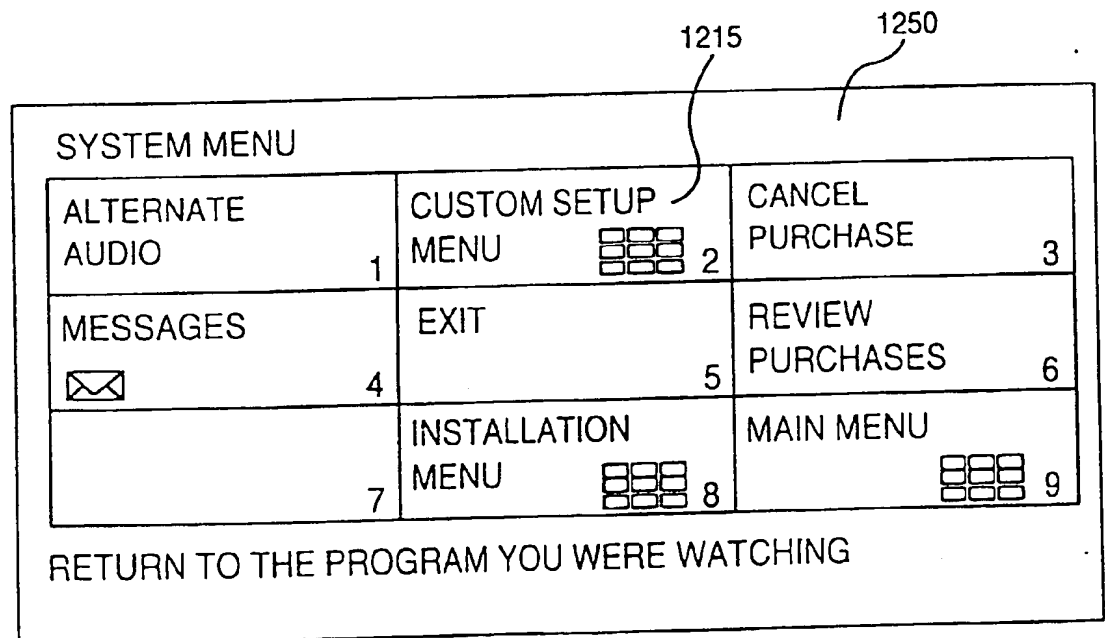


FIG. 12B



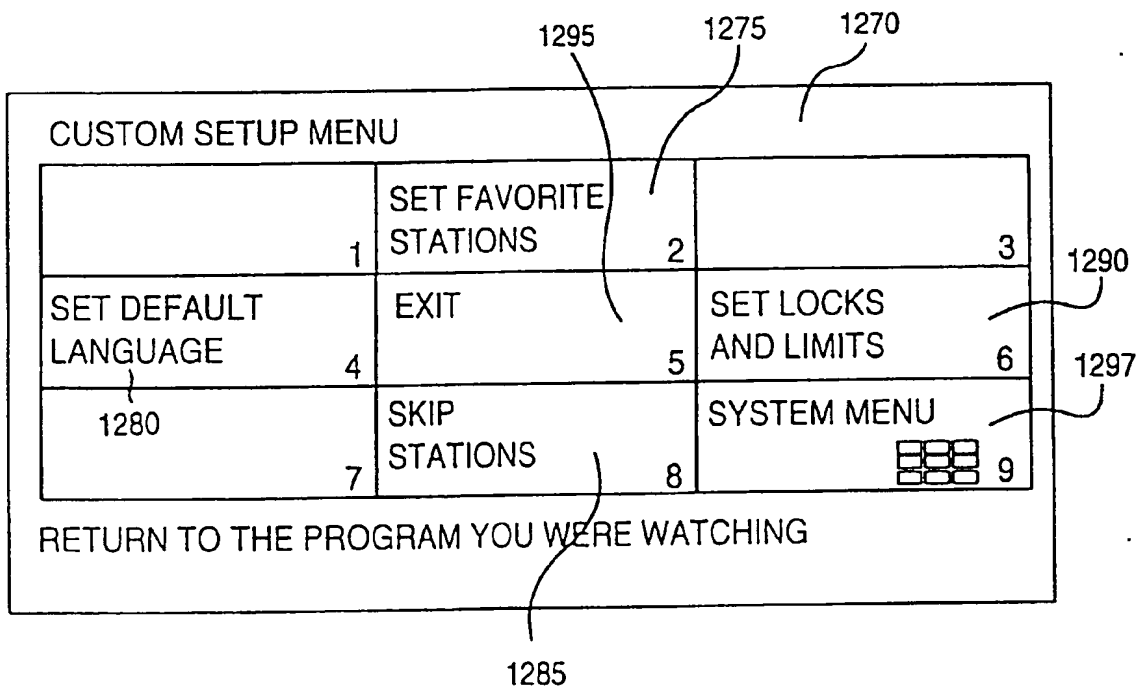


FIG. 12C

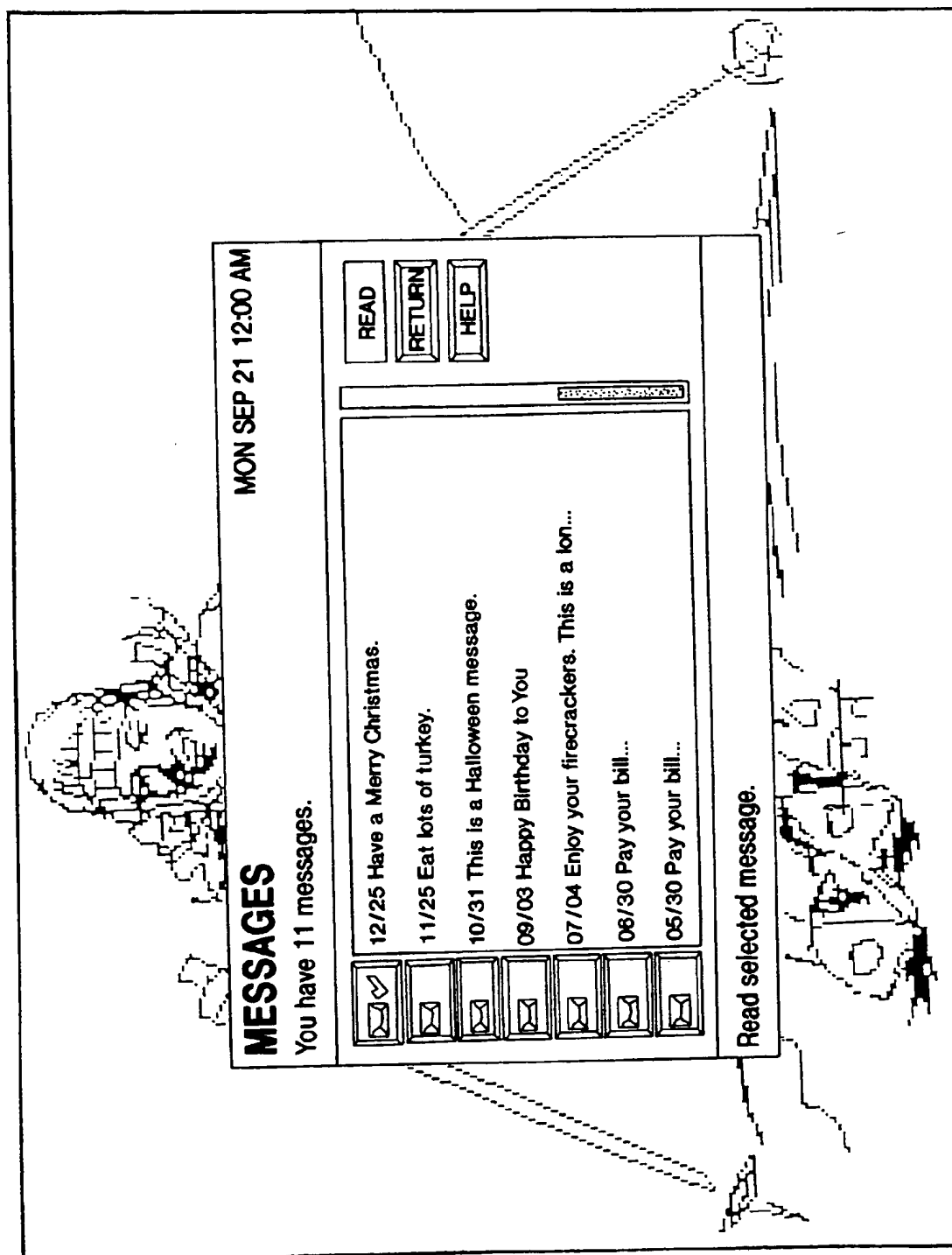


FIG. 12D

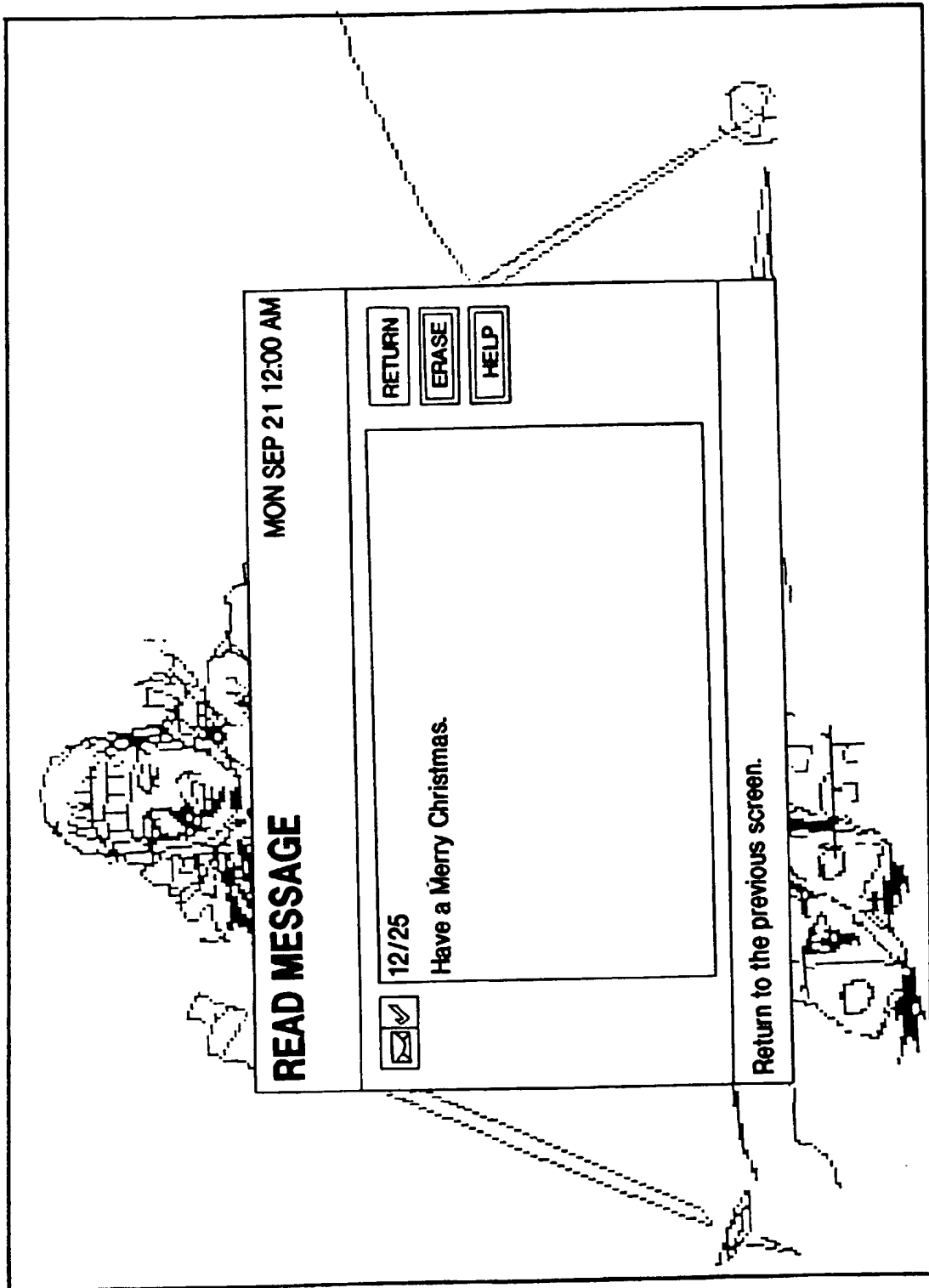


FIG. 12E

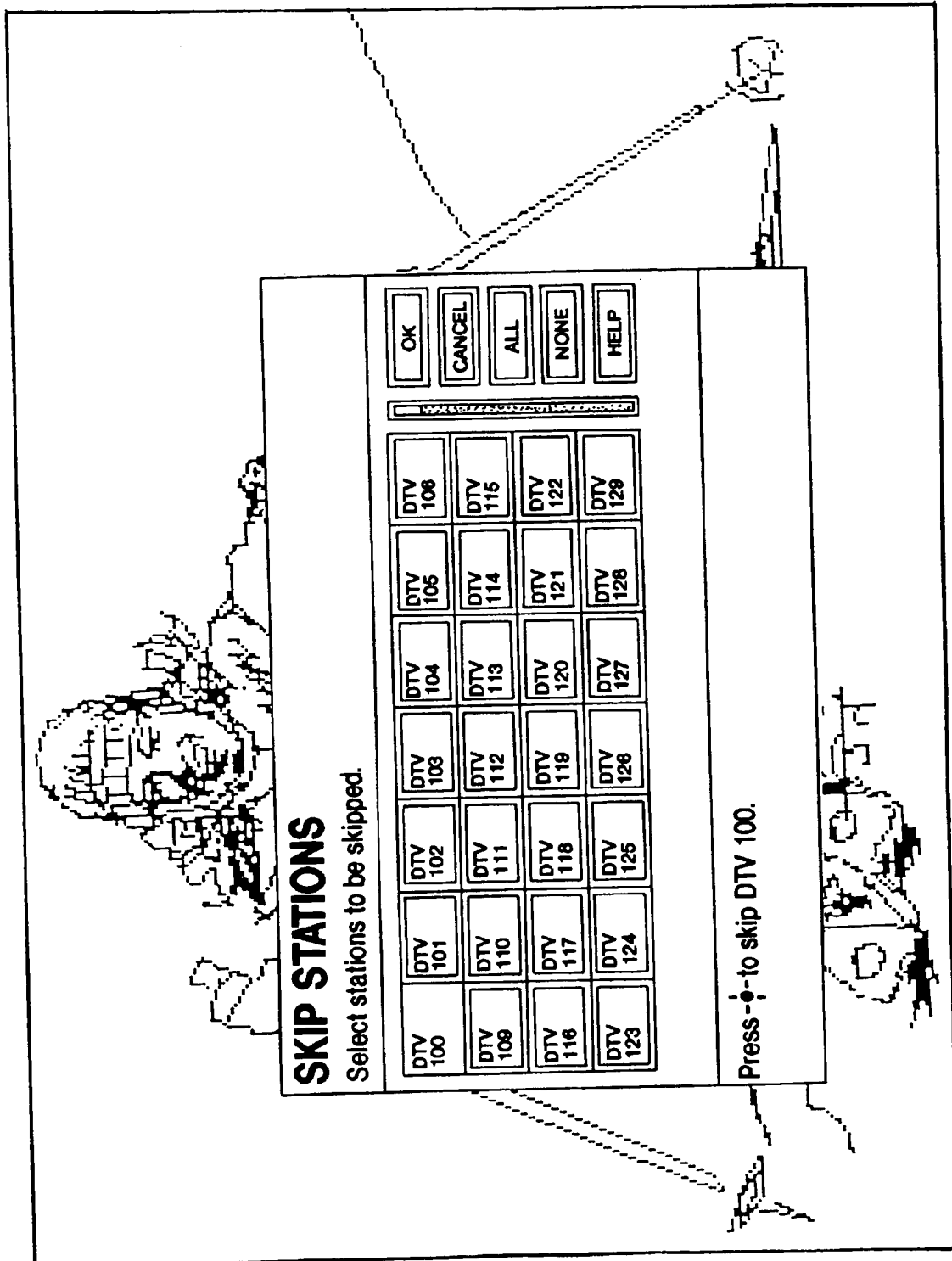


FIG. 12F

OTHER GUIDE CATEOGRY MON SEP 21 12:00 AM

Select category for the program guide

MOVIES	SPORTS	SPECIAL	SERIES	Help EXIT CANCEL
NEWS	SHOPPING	MUSIC	ATTRACTIONS	

Save your selections and return to the previous screen

FIG. 13A

SELECT MOVIES SUBCATEGORY MON SEP 21 12:00 AM

Select category for the program guide

ACTION ✓	CHILDREN ✓	COMEDY ✓	DRAMA ✓	OK cancel All None Help
ADVENTURE ✓				
FANTASY ✓	HORROR ✓	MUSICAL ✓	ROMANCE ✓	
SCIENCE FICTION ✓	WESTERN ✓	OTHER ✓		

Save your selections and return to the previous screen

FIG. 13B

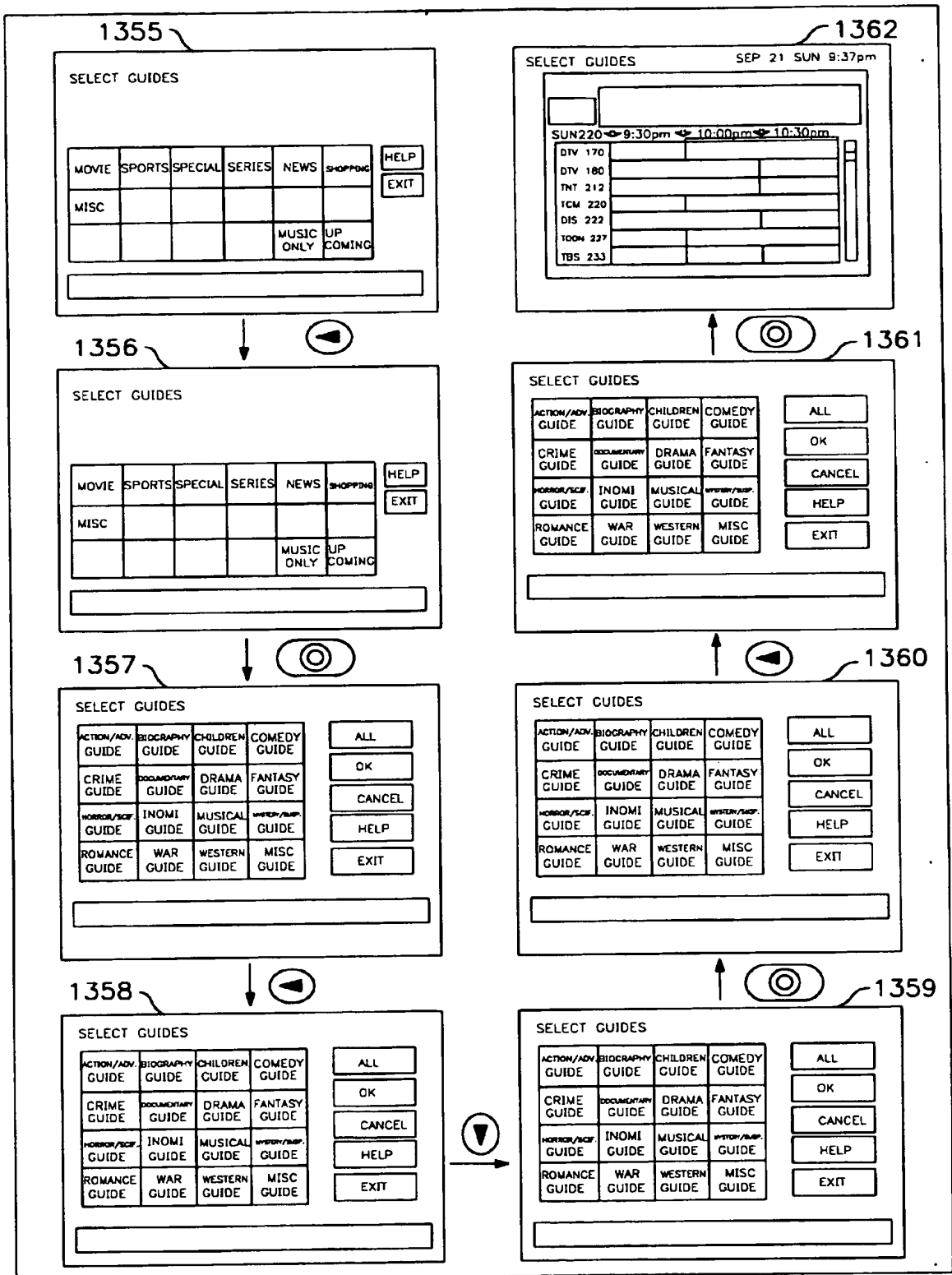


FIG. 13C

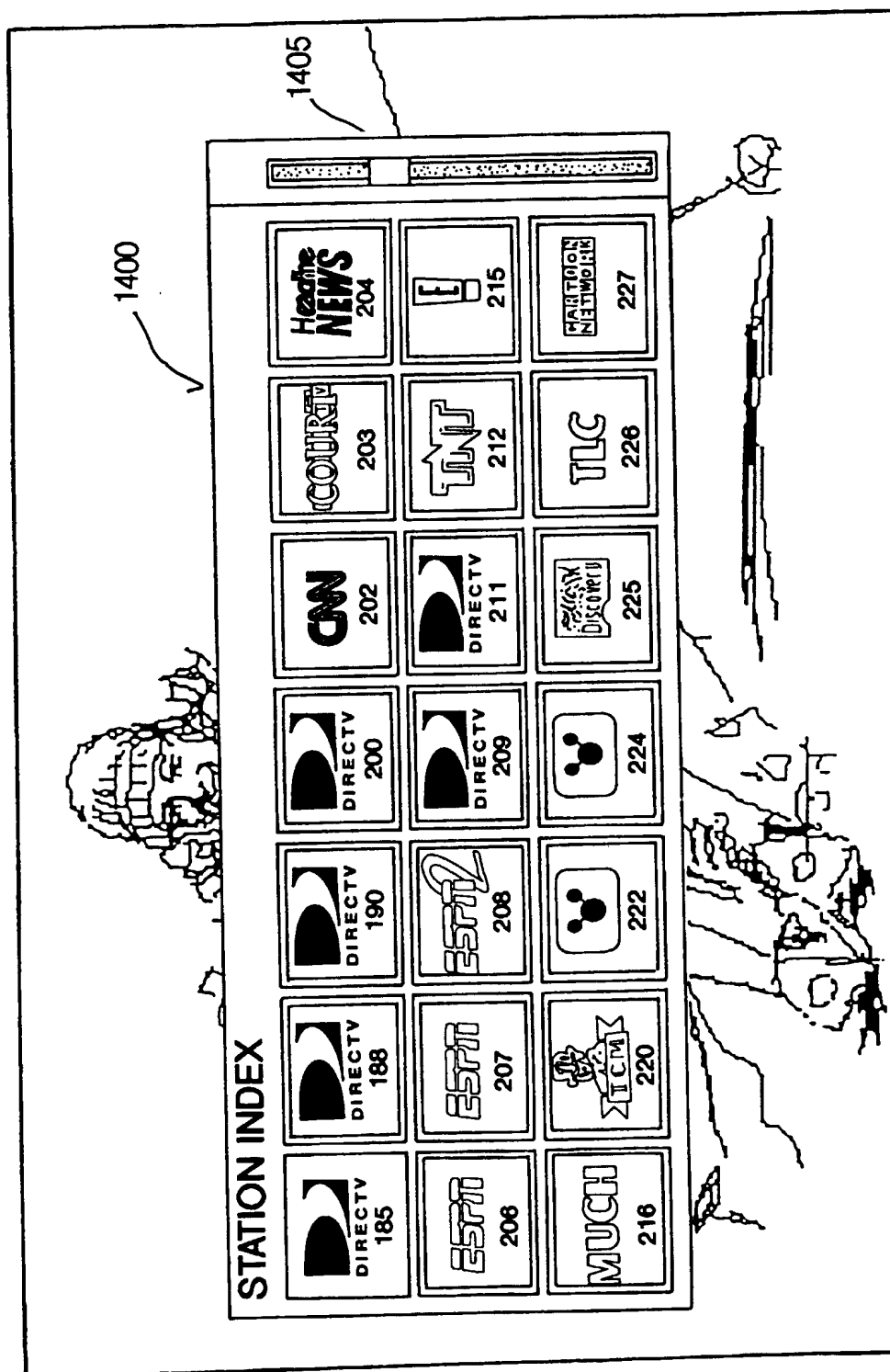


FIG. 14A

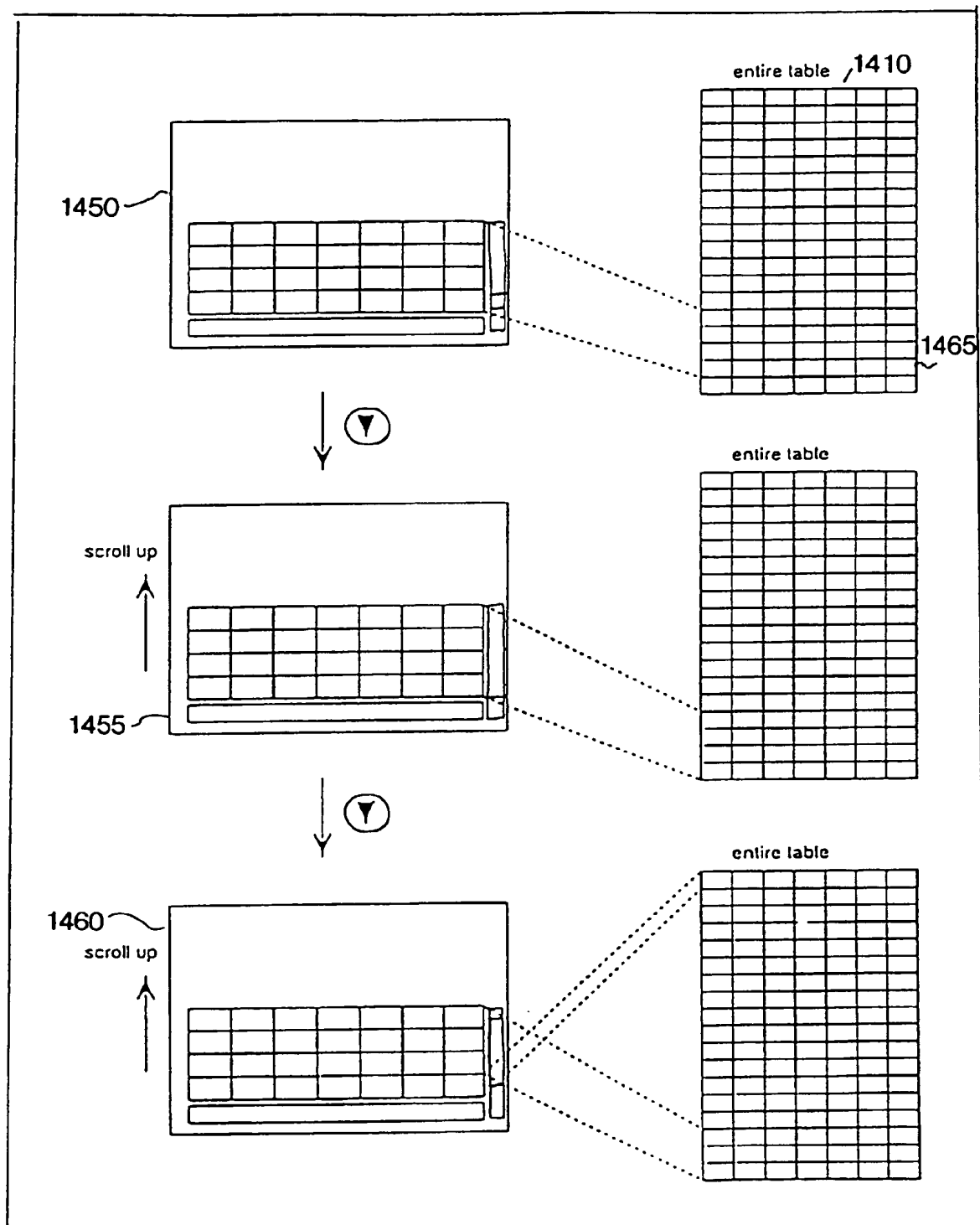
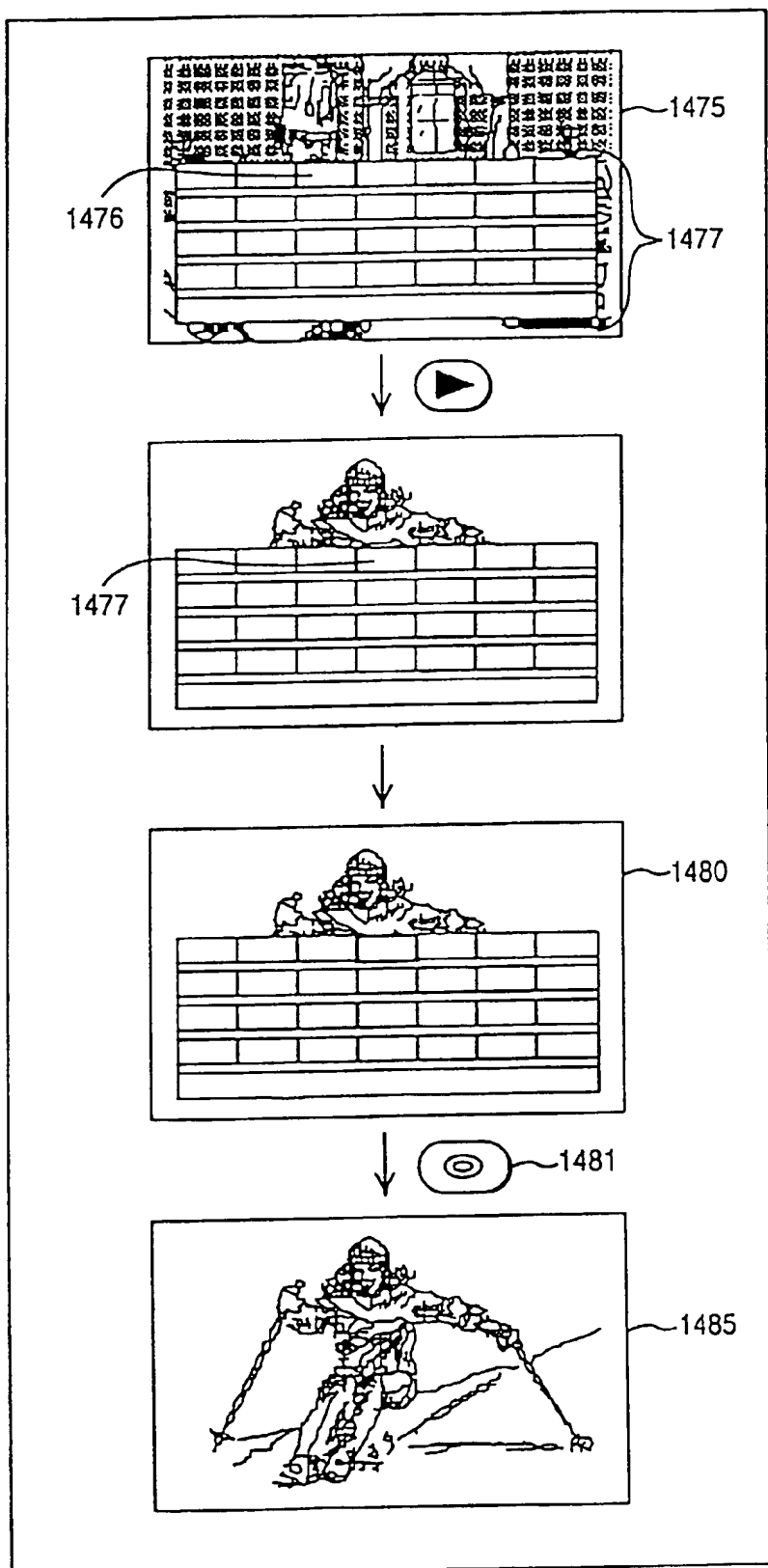


FIG. 14B



FIG. 14C



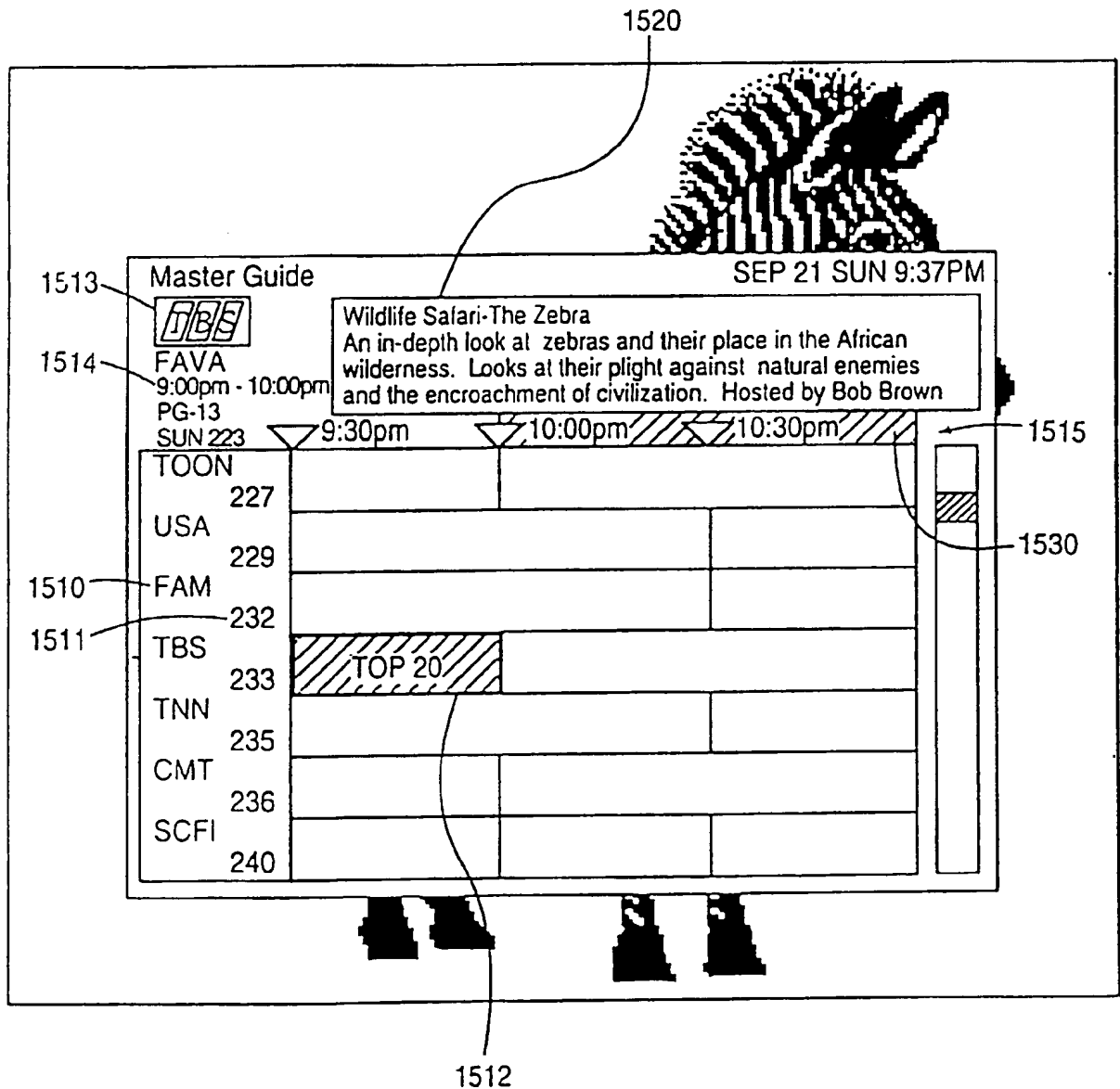


FIG. 15

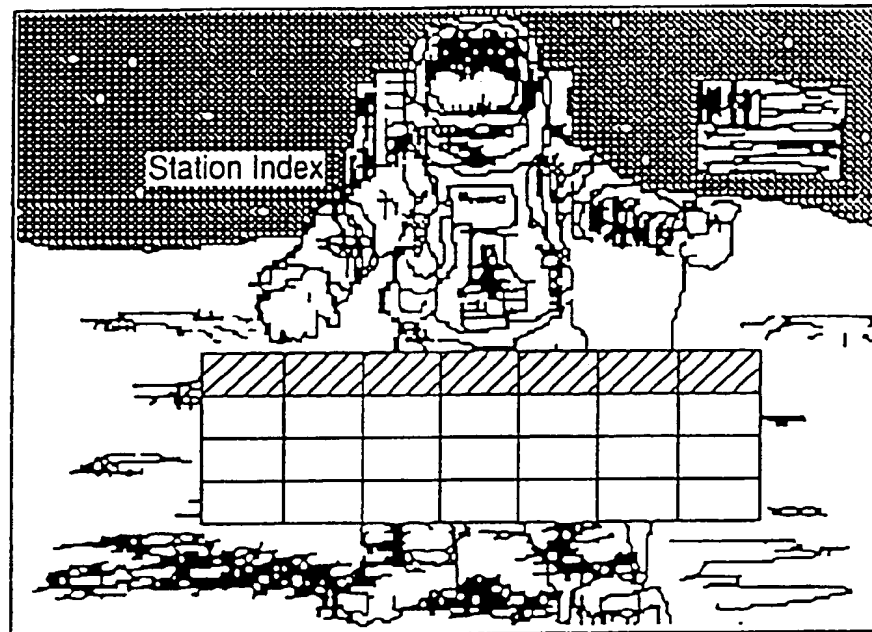


FIG. 16A

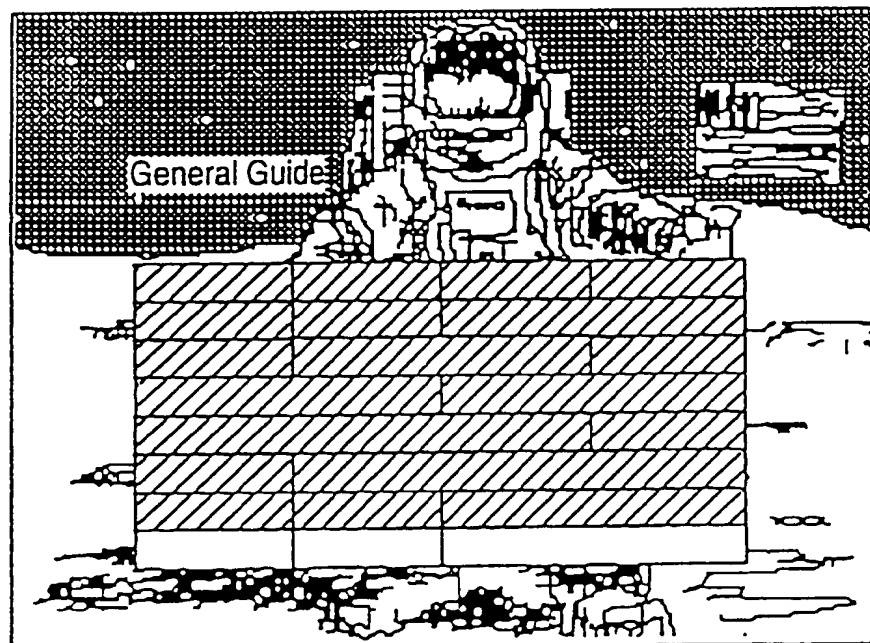


FIG. 16B

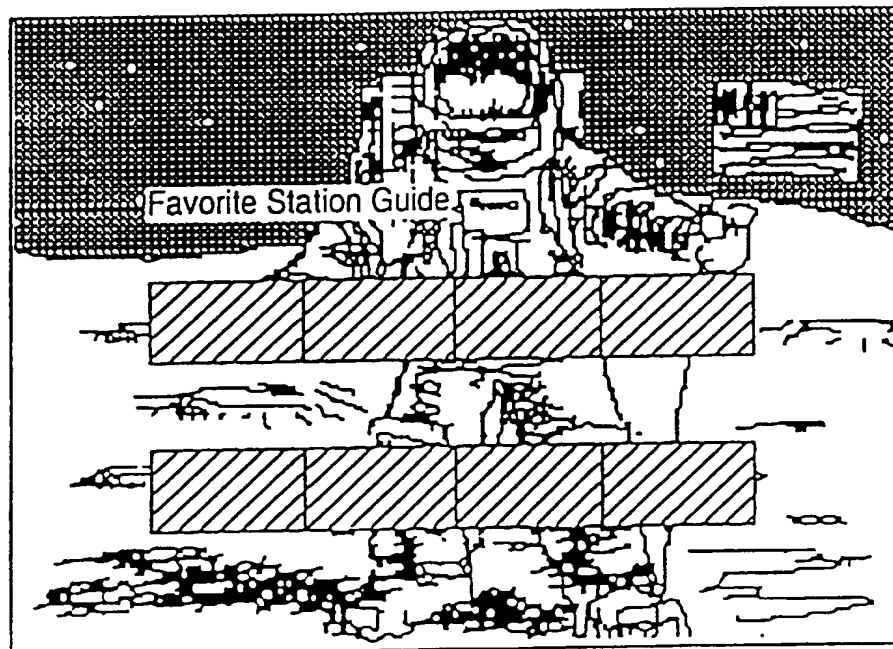


FIG. 16C

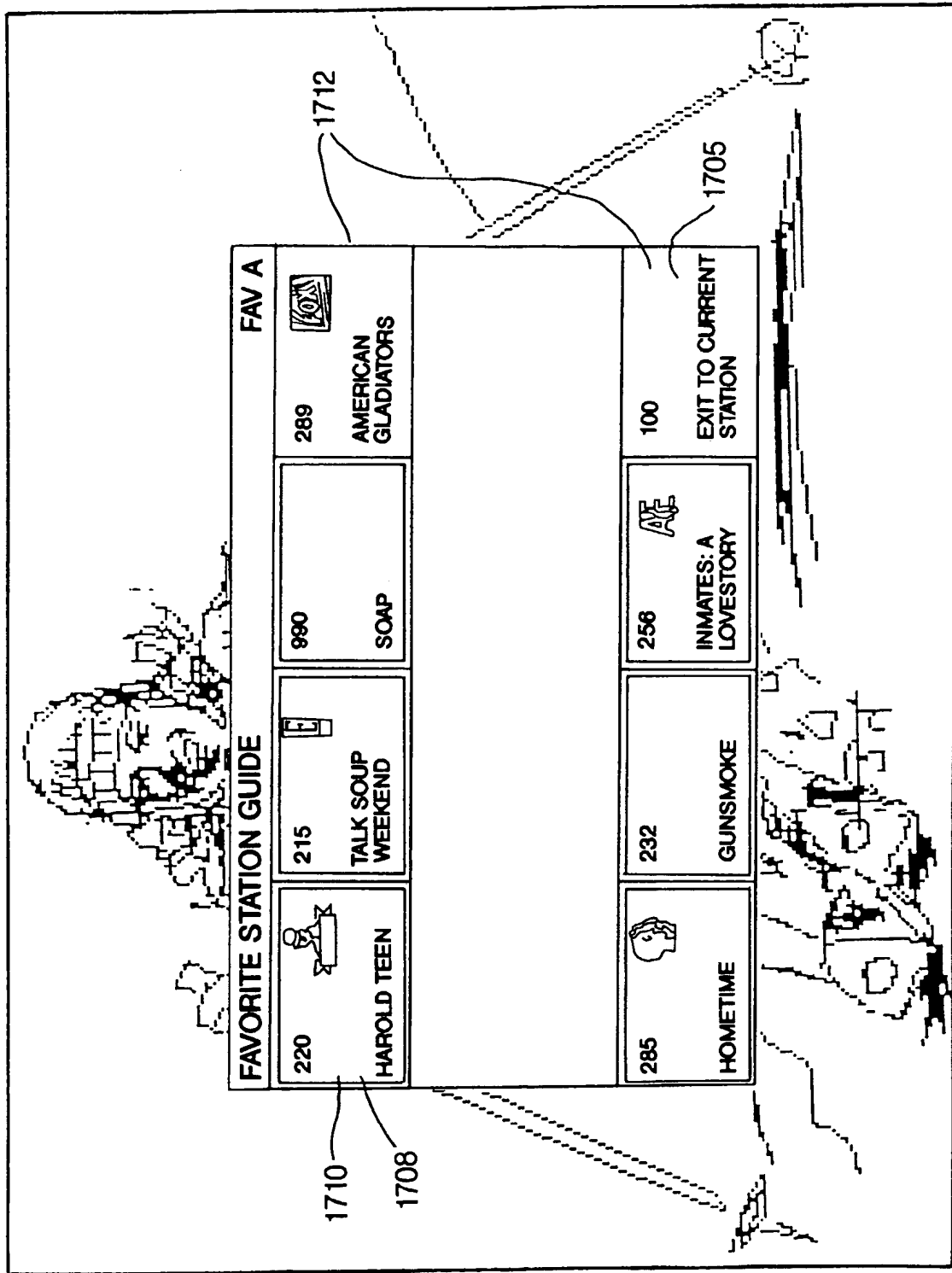


FIG. 17

**SET FAVORITE STATIONS**  
Create up to three Favorite Station Guides

FAV A	TCM 108	E! 215	Com 990	FOX 289	PBS 286	FAM 232	A&E 110	Return
								Help
FAV B								
FAV C								

Change FAV A favorite station list

FIG. 18A

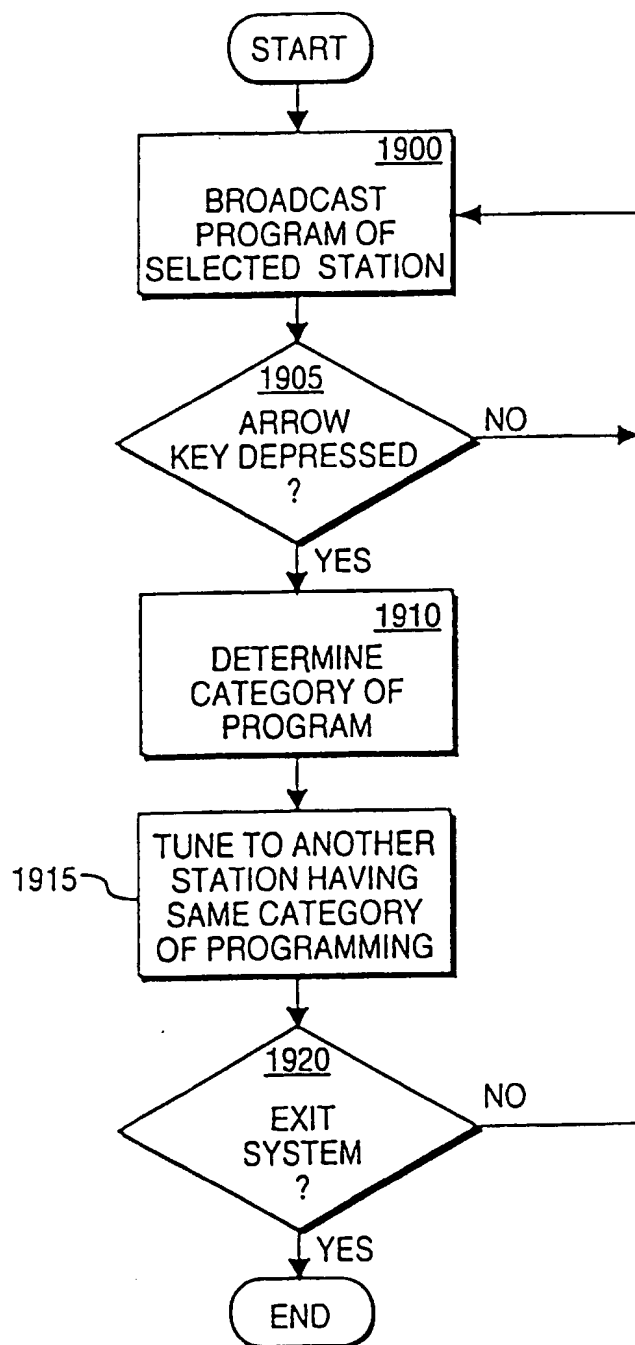
**SET FAVORITE STATIONS: FAV A**  
Change the stations included in FAV A

TCM 108	E! 215	Com 990	FOX 289	PBS 286	FAM 232	A&E 110	OK
							cancel
							clear
							Help

DTV 100	CNN 101	CRT 102	HLN 103	ESPN 104	TNT 105	TCM 108
TWC 109	A&E 110	DIS1 111	DISC 112	TOON 113	USA 114	CNBC 115
TBS 116	CMT 117	MUCH 118	DTV 119	CBS 120	ABC 121	NBC 122

To remove TCM 108, press ->- or enter another station number

FIG. 18B

**FIG. 19**

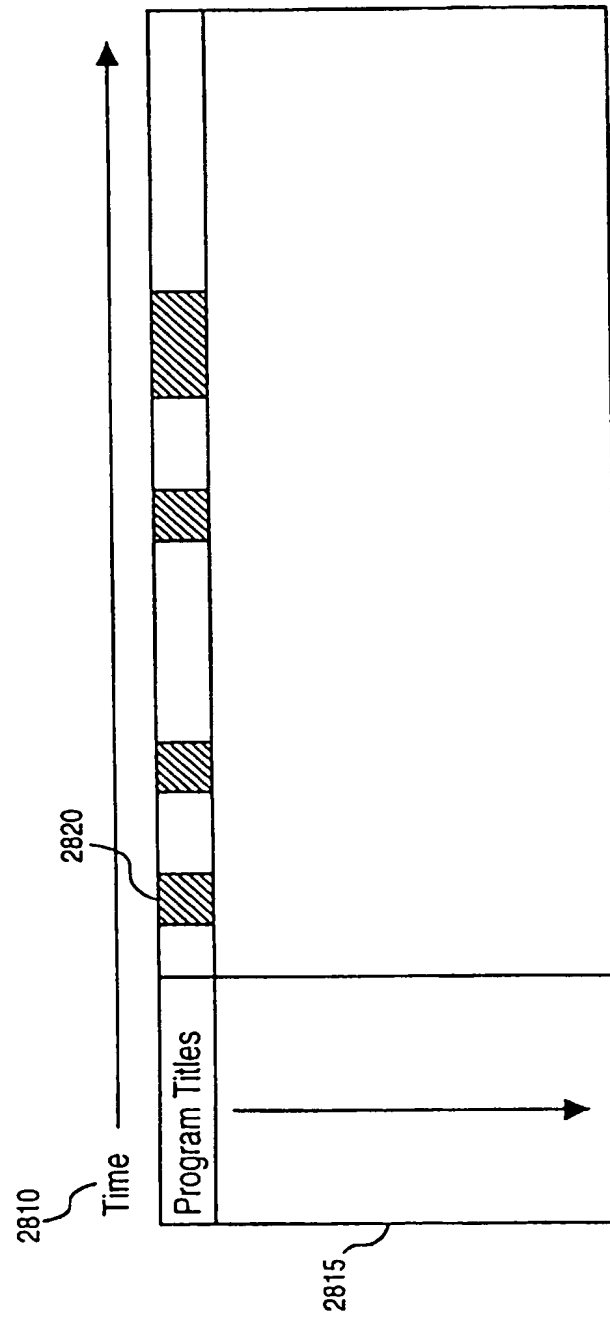
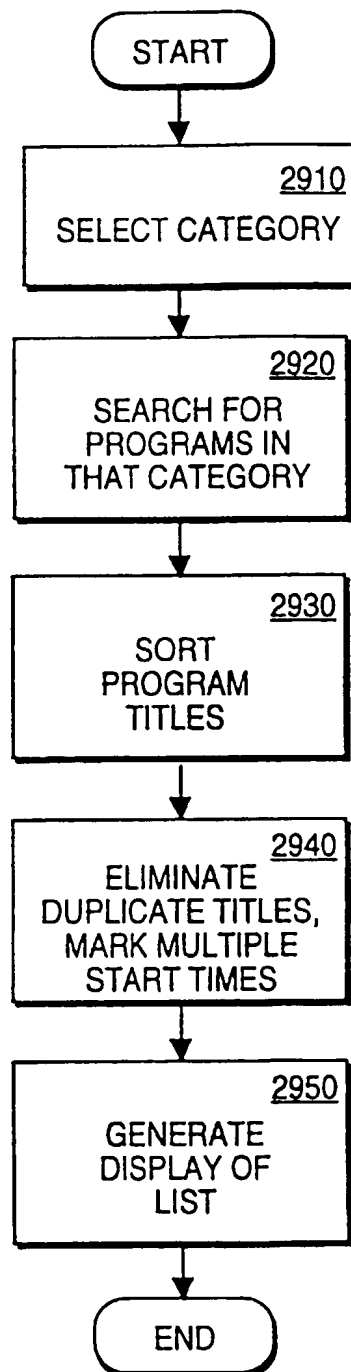


FIG. 20





**FIG. 21**

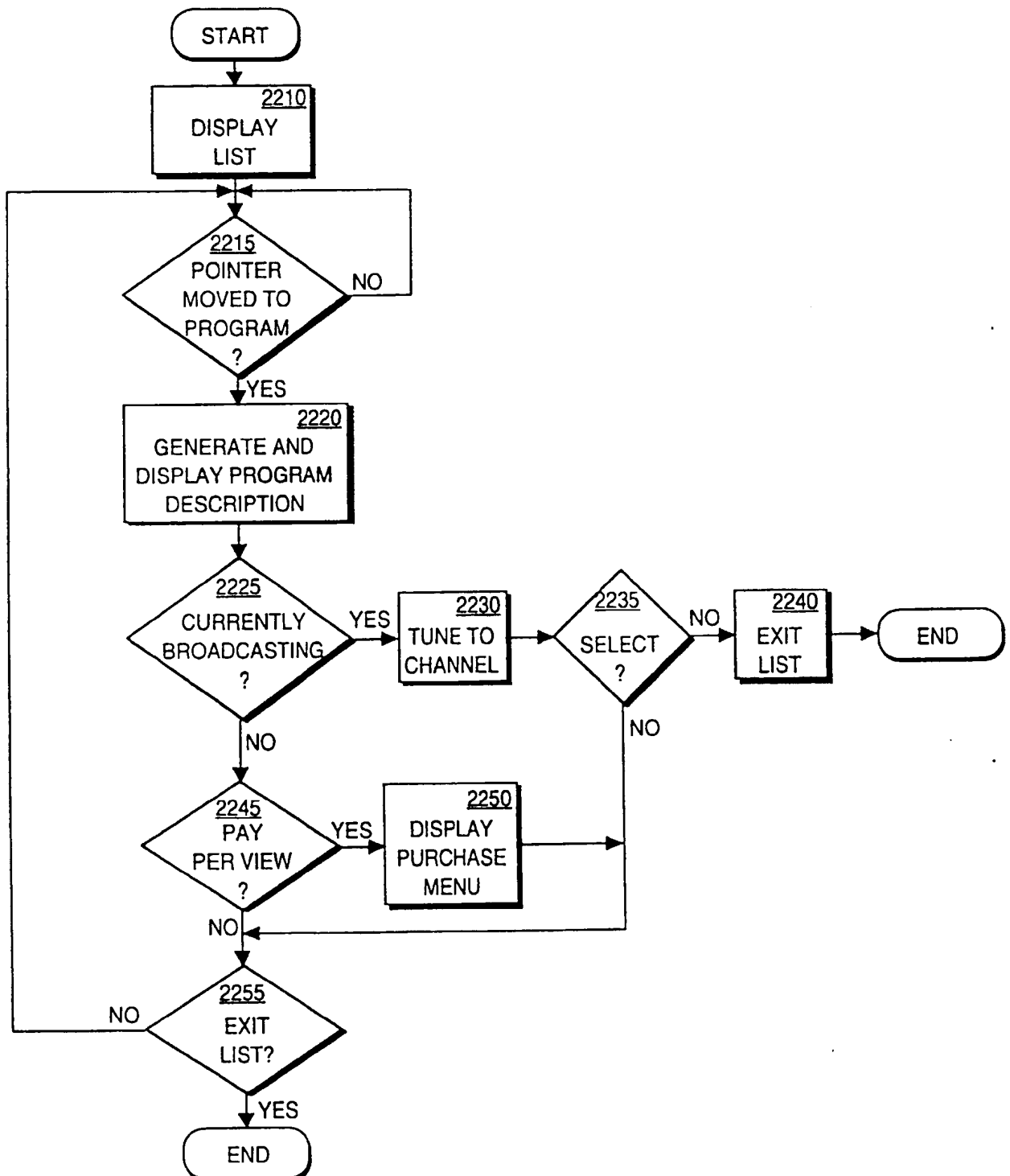
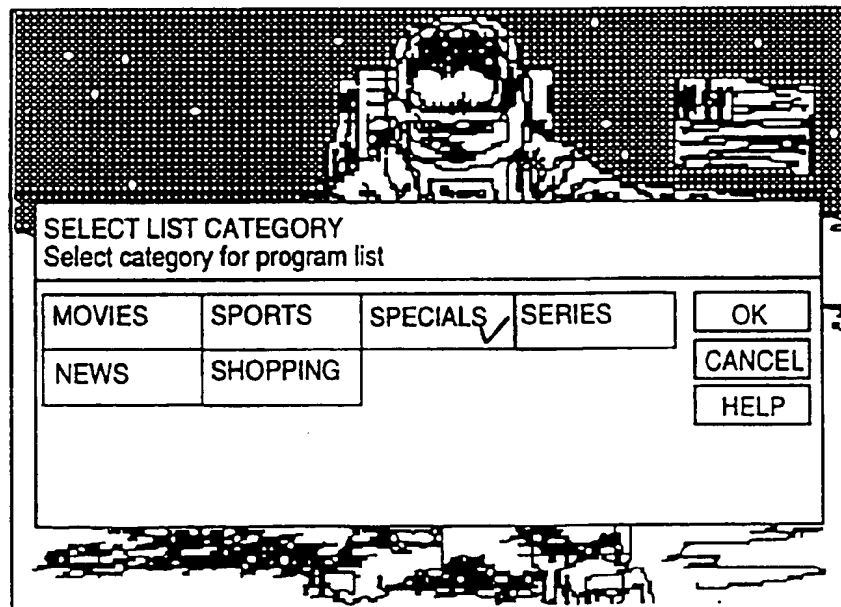
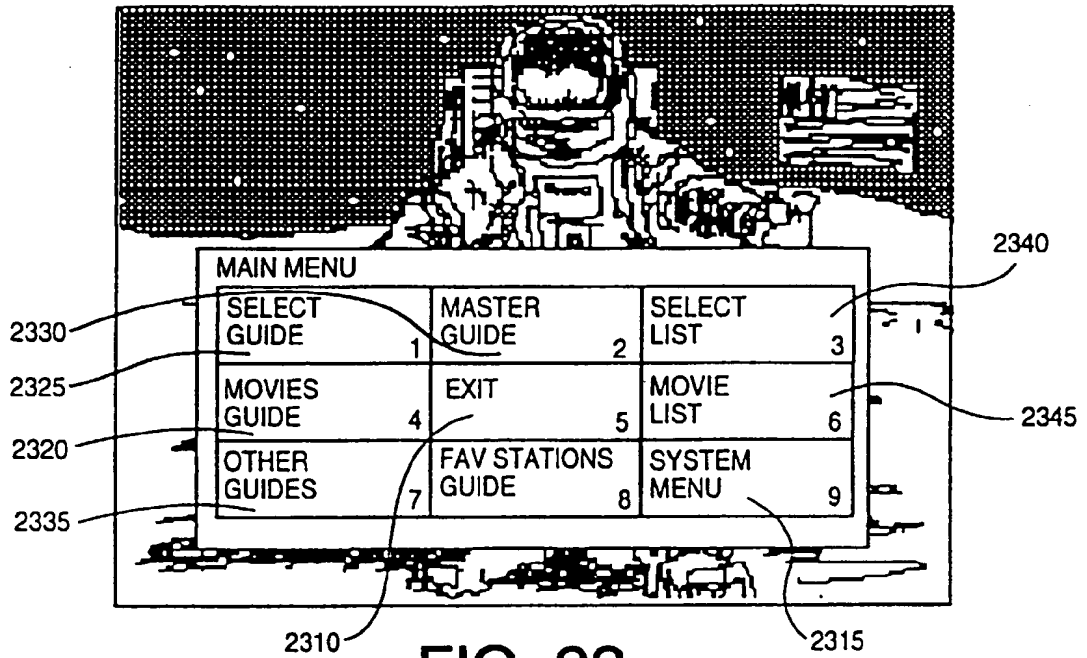


FIG. 22



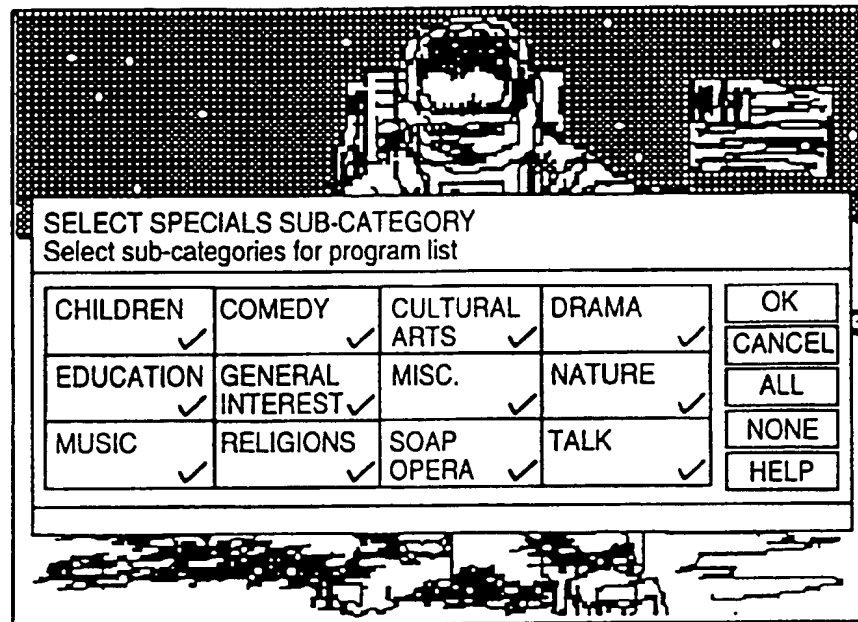


FIG. 25

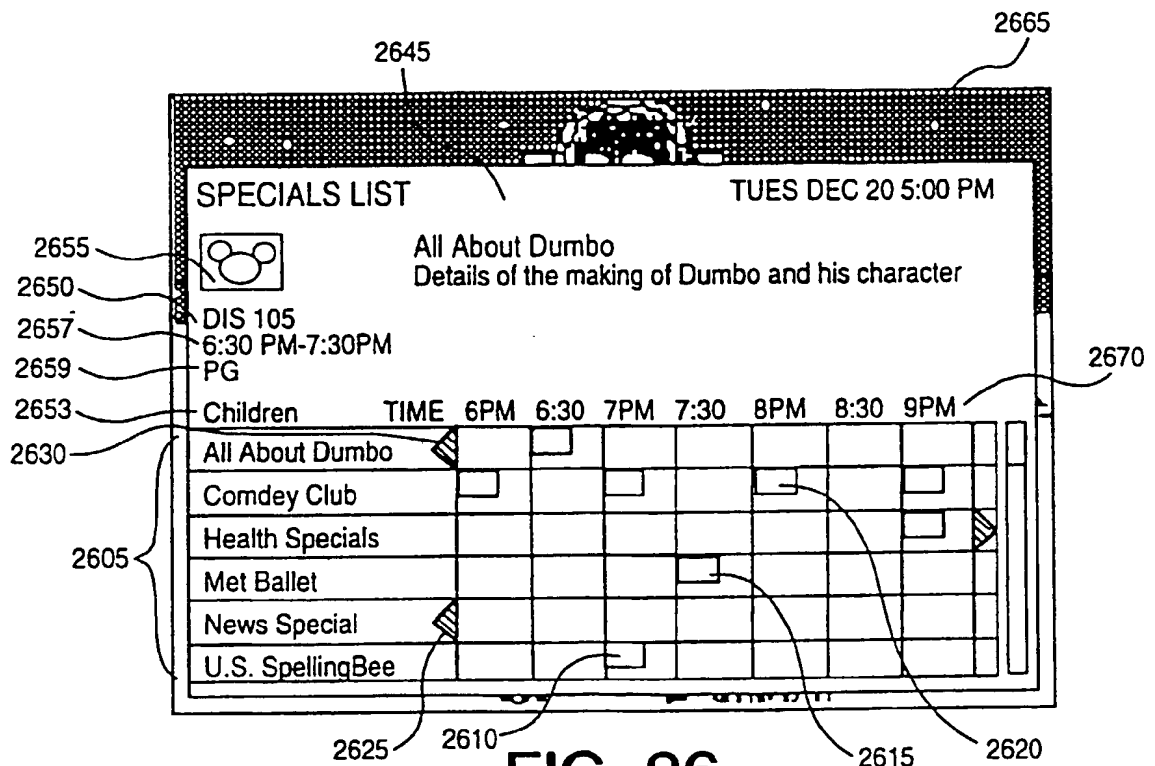


FIG. 26

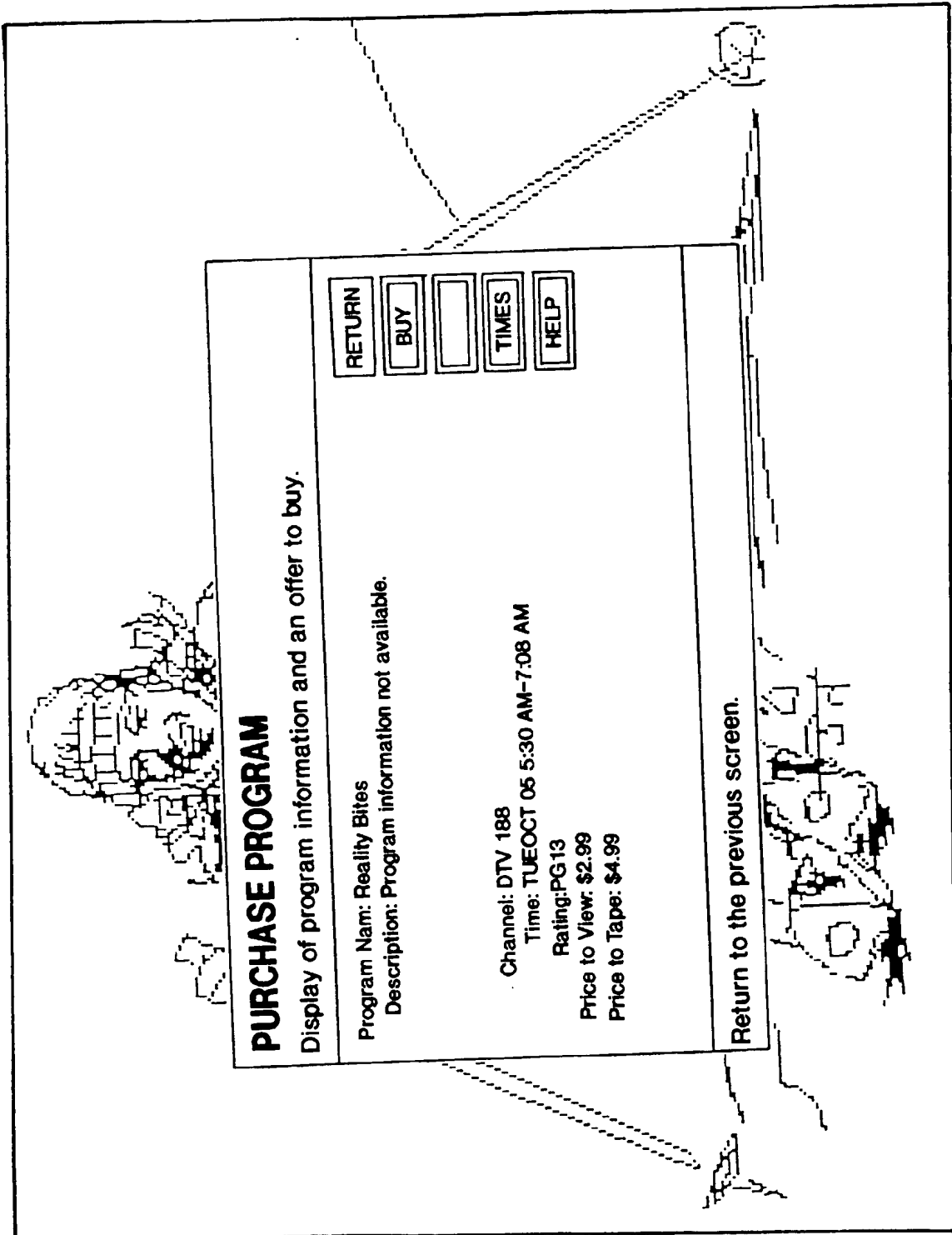


FIG. 27A

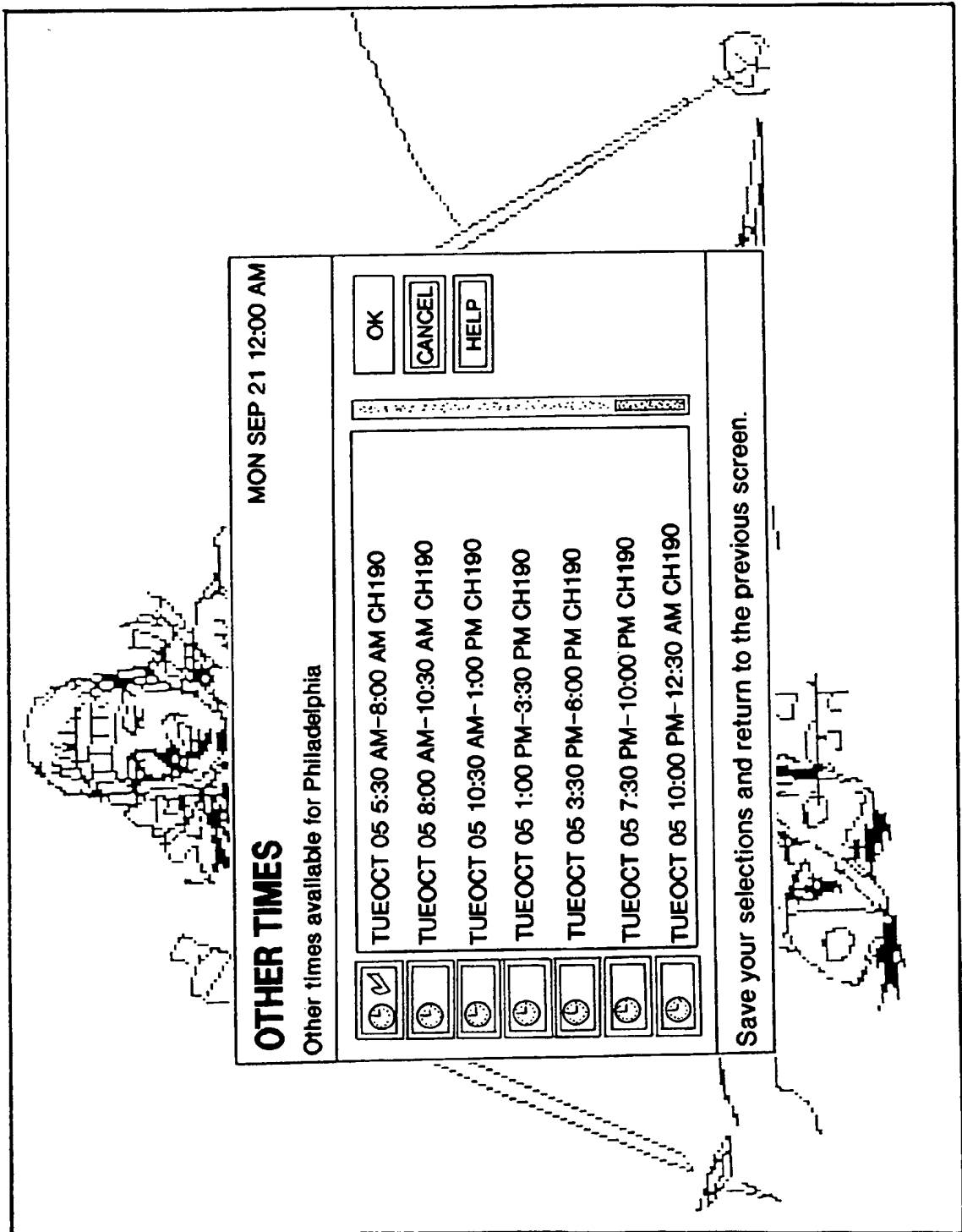
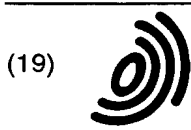


FIG. 27B



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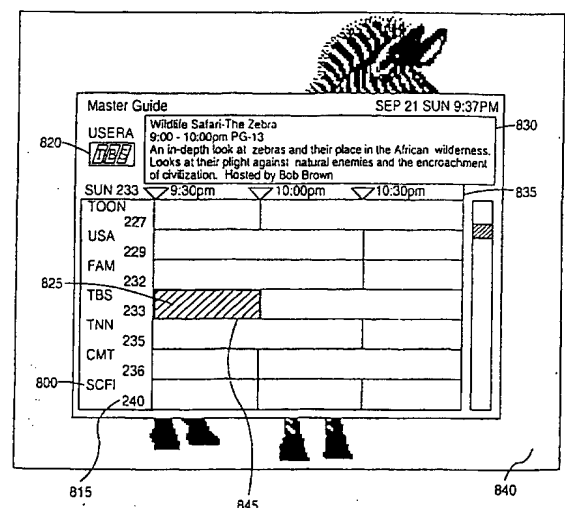
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(54) **On screen programme list display for multiple channel broadcasting systems**

(57) An easy to use on-line guide provides the user of a multiple channel television broadcast system with a wealth of programming information in a simple format that is easy to understand. The guide enables the user to easily select a particular program to watch. In particular, when the guide is presented to the user, the guide covers only a portion of the actual television screen or display. The remaining portion of the television screen continues to broadcast the audio and video of the currently selected program. As a user scans through the guide and moves the pointer from one station to another, the system responds by automatically tuning to the channel pointed to by the pointer and provides the audio and displays the video in the portion of the screen not covered by the guide. Furthermore, a written description of the program currently broadcasted on a station that the cursor currently points to is also shown. In addition, the system provides an innovative mechanism to enable the user to scan program information of channels that the user has designated as his favorite channels. In another embodiment, a program list that is oriented according to the program, instead of the channel, is pre-

sented.



**FIG. 8**



European Patent  
Office

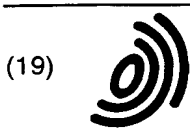
# EUROPEAN SEARCH REPORT

Application Number  
EP 96 30 0033

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP 0 267 020 A (MATSUSHITA ELECTRIC IND CO LTD) * abstract; figure 4 *	1-13	H04N5/445
A	US 5 353 121 A (YOUNG PATRICK ET AL) * column 5, line 43 - column 6, line 9 *	1-13	
A	US 5 223 924 A (STRUBBE HUGO J) * column 2, line 3 - line 15 *	1-13	
			TECHNICAL FIELDS SEARCHED (Int.Cl.8)
			H04N
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>2 April 1998</b>	Examiner <b>Peeters, M</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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(54) A scheduler apparatus for use in a television receiver

(57) In a television system in which at least program title information for programs which are to be transmitted in the future is transmitted in advance to form a channel guide listing, apparatus is provided for searching for specific television programs which satisfy certain criteria concerning a user's viewing preferences, and upon successful conclusion to the search, the apparatus gener-

ates a list of such television programs in order to predict for the viewer certain programs which may be of interest. In a first embodiment of the invention the apparatus stores information about the particular television shows which the user watches, as search criteria. In a second embodiment of the invention the search criteria is editable by the viewer to further refine the searches.

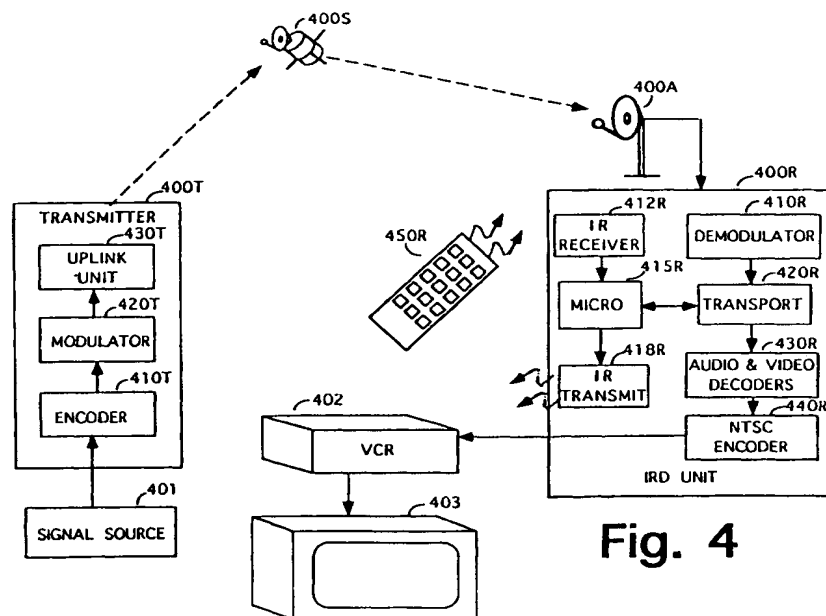


Fig. 4

EP 0 774 866 A2

## Description

The subject invention concerns apparatus for scheduling the selection of a television program for watching or recording at some future date.

The act of selecting a television program to watch has become more complicated in that the number of available channels has increased dramatically of late. For example RCA® DSS® direct broadcast satellite receivers provide as many as 150 channels to choose from. Heretofore, a user who wanted to see "what's on" could merely consult a television schedule printed in his local newspaper in the hope that he would eventually find a program which sparked his interest.

Such a practice may work well when there are only a few television channel schedules to examine, however, it is unlikely that a viewer would be able to examine the complete schedules for 150 television channels, just to see "what's on" at a given time. Such a task would be daunting even if all of the programs were to be listed by category. A viewer may find that there are only a few programs of interest to him out of the vast number of available programs. That is, the chaff outnumbers and tends to hide the wheat. Consequently, it is felt that as the number of channels increases, the chances of successfully locating a desirable program in a short time become more and more unlikely.

In a television system in which at least program title information for programs which are to be transmitted in the future is transmitted in advance to form a channel guide listing, apparatus is provided for searching for specific television programs which satisfy certain criteria concerning a user's viewing preferences, and upon successful conclusion to the search, the apparatus generates a list of such television programs in order to predict for the viewer certain programs which may be of interest. In a first embodiment of the invention the apparatus stores information about the particular television shows which the user watches, as search criteria. In a second embodiment of the invention the search criteria is editable by the viewer to further refine the searches.

FIGURE 1 is an illustration of a screen display, in accordance with an aspect of the invention.

FIGURE 2 is an illustration of a screen display showing a viewed item list in accordance with another aspect of the invention.

FIGURE 3 is a flowchart useful in understanding the invention.

FIGURE 4 is an illustration in block diagram form of apparatus suitable for use with the invention.

FIGURE 5 is a flowchart useful in understanding the invention.

FIGURES 6a-6c are illustrations of screen displays produced in accordance with the invention.

Television systems such as the RCA® DSS® direct broadcast satellite system and Starsight® transmit channel guides for display on the television receivers of subscribers.

FIGURE 1 shows a Program Guide screen display 110 produced, for example, by an RCA® DSS® direct broadcast satellite receiver system, manufactured by Thomson Consumer Electronics, Inc. Indianapolis, IN.

A user selects a television program from a Program Guide for viewing, by moving a cursor (via operation of remote control up, down, right, and left, direction control keys, not shown) to a block of the program guide screen display which contains the name of the desired program. When a SELECT key of the remote control is pressed, the current x and y position of the cursor is evaluated to derive virtual channel and program time information. In this example of FIGURE 1, a particular television show, CINE SATURDAY NIGHT MOVIE: ZULU has been highlighted for selection by use of the cursor keys on a remote control unit (e. g., 450R of FIGURE 4). The highlighting is illustrated by the dark box outlining the title in FIGURE 1. Normally, upon pressing the select key, the relevant programming data is transferred to a programming unit. Note also that an auxiliary text display 120 is shown. Auxiliary text display 120 provides additional data relating to the highlighted television program. A further use for the data provided by channel guide screen 110 and auxiliary text display 120 will be described below.

FIGURE 2 shows a "predictive agent list" or "viewed item list" which may be generated as a screen display 210. Data is automatically stored in this predictive agent list by the apparatus of the invention, whenever a program is watch for a given period of time, for example, 5 or more minutes. In this way, a record is kept of the user's viewing habits so that the apparatus can be guided to make a prediction of which upcoming shows may be of interest to the viewer.

A predictive agent list 210 is illustrated in FIGURE 2. In the example of FIGURE 2, the viewer has watched 7 movies, (the television program type "movies" is a broad classification known as a "topic"). The last movie was watched on 15 November 1995. Of these 7 movies there were three movies having the theme "comedy", and four movies having the theme "drama". The last comedy was watched on 15 November 1995, and the last drama was watched on 27 September 1995. The viewer also watched 21 episodes of a television program entitled "The Simpsons". Note that an indication of whether each item is locked or unlocked is also stored in the predictive agent list. A viewer may lock an item to prevent the system from automatically deleting that item, if that particular item has not been watched recently. Moreover, the user may edit the viewed item list in order to provide a better filter for the television programs to be predicted (see FIGURE 6c).

Automatic loading of the viewed item list is shown in the flowchart of FIGURE 3, wherein the routine is entered at step 300. At step 305, a check is made to see if the tuner has been tuned to the current channel for at least five minutes. If not, the routine is exited at step 310. If so, the routine advances to step 320 to get the

viewed item list from memory. At step 325, a check is made to see if an item matching the currently viewed television program already exists in the viewed item list. If so, the count of that item is incremented and the routine is exited at step 335. If an item matching the currently viewed television program does not already exist in the viewed item list, then the routine advances to step 340. At step 340 a check is made to see if the list is full. If not, then data indicative of the currently viewed television program is added to the viewed item list, and the routine is exited at step 335. If, at step 340, it was determined that the viewed item list was full, then at step 350 the routine will read the least recently viewed item of the list. At step 355, a check will be made to see if that item is locked. If so, it means that the viewer does not want that item to be deleted, and the routine loops back to step 360 to get the next least recently viewed item from the list. That item will in turn be checked at step 355 to see if it is locked. If not, the routine will advance to step 365 where that item will be deleted to provide free space in the list. The routine will then advance to step 345, add the new item to the list, and exit at step 335.

A viewer may request a search to see "what's on" at any given time (see FIGURE 6a). The result of that search will be a list of predictions of television programs which the user might find interesting. Such a list of predictions will be displayed to the user by means of an on-screen display (see FIGURE 6b). The displayed list may be presented in a "weighted" fashion, for example in descending order of the number of times that a particular type of show was watched. Generation of this list of predictions is shown in the flowchart of FIGURE 5.

As noted above, the channel guide data used by the controller of the subject apparatus to form the above-described interactive or confirmation sentences may be received from a satellite television communication system. FIGURE 4 shows such a satellite television communication system in which, a satellite 400S receives a signal representing audio, video, or data information from an earth-based transmitter 400T. The satellite amplifies and rebroadcasts this signal to a plurality of receivers 400R, located at the residences of consumers, via transponders operating at specified frequencies and having given bandwidths. Such a system includes an uplink transmitting portion (earth to satellite), an earth-orbiting satellite receiving and transmitting unit, and a downlink portion (satellite to earth) including a receiver located at the user's residence.

In a such a satellite system, the information necessary to select a given television program is not fixedly-programmed into each receiver but is rather is downloaded from the satellite continually on each transponder. The television program selection information comprises a set of data known as a Master Program Guide (MPG), which relates television program titles, their start and end times, a virtual channel number to be displayed to the user, and information allocating virtual channels

to transponder frequencies and to a position in the time-multiplexed data stream transmitted by a particular transponder. In such a system, it is not possible to tune any channel until the first master program guide is received from the satellite, because the receiver (IRD, or Integrated Receiver Decoder) literally does not know where any channel is located, in terms of frequency and position (i.e. data time slot) within the data stream of any transponder.

A master program guide is preferably transmitted on all transponders with the television program video and audio data, and is repeated periodically, for example, every 2 seconds. The master program guide, once received, is maintained in a memory unit in the receiver, and updated periodically, for example every 30 minutes. Retention of the master program guide allows instantaneous television program selection because the necessary selection data are always available. If the master program guide were to be discarded after using it to select a television program, then a delay of at least two seconds would be incurred while a new program guide was acquired, before any further television program selections could be performed.

Once the channel transponder carrying a desired television program is tuned, the data packets containing the audio and video information for that program can be selected from the data stream received from the transponder by examining the data packets for the proper SCID (Service Component Identifier) 12 bit code. If the SCID of the currently received data packet matches the SCID of the desired television program as listed in the program guide, then the data packet is routed to the proper data processing sections of the receiver. If the SCID of a particular packet does not match the SCID of the desired television program as listed in the program guide, then that data packet is discarded.

A brief description of system hardware, suitable for implementing the above-described invention, now follows. In FIGURE 4, a transmitter 400T processes a data signal from a source 401 (e.g., a television signal source) and transmits it to a satellite 400S which receives and rebroadcasts the signal to a receiving antenna 400A which applies the signal to a receiver 400R. Transmitter 400T includes an encoder 410T, a modulator (i.e., modulator/forward error corrector (FEC)) 420T, and an uplink unit 430T. Encoder 410T compresses and encodes signals from source 401 according to a predetermined standard such as MPEG. MPEG is an international standard developed by the Moving Picture Expert Group of the International Standards Organization for coded representation of moving pictures and associated audio stored on digital storage medium. An encoded signal from unit 410T is supplied to modulator/Forward Error Corrector (FEC) 420T, which encodes the signal with error correction data, and Quaternary Phase Shift Key (QPSK) modulates the encoded signal onto a carrier.

Uplink unit 430T transmits the compressed and encoded signal to satellite 400S, which broadcasts the sig-

nal to a selected geographic reception area. The signal from satellite 400S is received by an antenna dish 400A coupled to an input of a so-called set-top receiver 400R (i.e., an interface device situated atop a television receiver). Receiver 400R includes a demodulator (demodulator/Forward Error Correction (FEC) decoder) 410R to demodulate the signal and to decode the error correction data, an IR receiver 412 for receiving IR remote control commands, a microprocessor 415R, which operates interactively with demodulator/FEC unit 410R, and a transport unit 420R to transport the signal to an appropriate decoder 430R within unit 400R depending on the content of the signal, i.e., audio or video information. An NTSC Encoder 440R encodes the decoded signal to a format suitable for use by signal processing circuits in a standard NTSC consumer VCR 402 and standard NTSC consumer television receiver 403. Microprocessor (or microcontroller, or microcomputer) 415R receives infrared (IR) control signals from remote control unit 450R, and sends control information to VCR 402 via an IR link 418R. Microprocessor 415R also generates the on-screen display (OSD) signals needed for presenting the interactive sentence, or confirmation sentence, to the user. Microprocessor 415R also receives and interprets cursor key X and Y information in order to control the highlighting of user choices in the on-screen displays.

The routine for automatic generation of the predictive list is set forth in FIGURE 5. The routine is entered at step 500, and at step 520, a search of the newly received program guide is performed for a match with search terms in the viewed item list of FIGURE 2. Note that the additional program descriptive data 120 of FIGURE 1 is also to be search for a correspondence with the search terms of FIGURE 2. The search routine loops at step 525 until completed. At step 530, the list is weighted for display. The list of items predicted to be of interest to the viewer is then displayed at step 535, and the program exited at step 540.

FIGURES 6a-6c show screen displays which enable the user to exercise the features of the invention. Specifically, FIGURE 6a is a Predictive Agent Main Menu screen accessed for example via the normal hierarchical menu system of the DSS® satellite television system. The screen display of FIGURE 6a has two "softkeys" labelled "Request a Suggestion" and "Edit User Information", respectively. Selecting "Request a Suggestion" causes a prediction operation to be performed, and brings up the screen display of FIGURE 6b. FIGURE 6b shows the predictions to the user, for example the movie Annie Hall on the Fox channel leads a list of shows predicted to be of interest to this particular viewer. The viewer may highlight one of the items on the list and then either tune to that show or record it. The other choice in the screen display of FIGURE 6a is "Edit User Information". Suppose the viewer had watched a show called (for purposes of this explanation) "Undesired Show". Further suppose that the viewer did not en-

joy the show and does not want that show to influence future predictions. By selecting the "Edit User Information" softkey, the screen of FIGURE 6c is brought up for display. The viewer may then highlight the entry for "Undesired Show" and delete it by pressing the "Delete Item" softkey. As noted above, the viewer may also lock a desired entry to keep it from being automatically deleted when space is needed, if that item has a low count, or hasn't been watched recently.

Although the invention was described with reference to a satellite television system, it is equally applicable to ground based television broadcast systems, both digital and analog.

## Claims

1. In a television system in which at least program title information for programs which are to be transmitted in the future is transmitted in advance to form a channel guide list, apparatus comprising:

memory means for storing data representing said channel guide list and for storing data representing a list of characteristics of television programs previously watched by a user; data entry means for entering user-entered data;

control means for performing a search of said channel guide listing for a match to said data representing said characteristics of television programs previously watched by said user; and on-screen display means for displaying text or graphics under control of said control means; upon successful conclusion of said search, said control means controls said on-screen display means to notify said user of an availability of a television program selected for sharing similar characteristics with entries of said list of characteristics of television programs previously watched by said user.

2. The apparatus of claim 1 wherein said characteristics of said list of characteristics of television programs previously watched by a user includes topic, title, date, or theme information.
3. The apparatus of claim 2 wherein said control means times a period beginning immediately after a user selects a television program, and if said period exceeds a predetermined amount of time, said control means modifies said list of characteristics of television programs previously watched by a user to reflect said television program selection.
4. The apparatus of claim 2 wherein, when television program-descriptive text accompanies said channel guide list, said control means performs a search

of said television program-descriptive text for a particular text string relating to title, star, director, theme, content advisory information, or content of said television program.

which may relate to title, star, director, or context of said television program.

5. The apparatus of claim 4 wherein, in response to user-entered data said control means controls said on-screen display means to display said list of characteristics, and said control means modifying said list of characteristics in response to user-entered data. 5 10
6. The apparatus of claim 1 wherein, said control means notifies said user of said availability of said television program by producing a display of television programs comprising a list of television programs having similar characteristics to characteristics of a previously watched television program. 15
7. The apparatus of claim 5 wherein, said on-screen display produced after successful completion of a search includes instructions to record said television program and instructions to notify the user of an availability of said television program, said instructions being selectable for execution by a user. 20 25
8. The apparatus of claim 2 wherein, in response to user-entered data said control means controls said on-screen display means to display said list of characteristics, said list of characteristics including an indication of the number of times each program type was viewed. 30
9. A television program searching method in a television system in which at least program title information for programs which are to be transmitted in the future is transmitted in advance to form a channel guide list, comprising the steps of: 35
  - storing in a memory means data representing said channel guide list and storing data representing characteristics of television programs previously watched by said user; 40
  - performing a search of said channel guide listing for a match to specific data representing said characteristics of television programs previously watched by said user; and 45
  - upon successful conclusion of said search, notifying said user of an availability of said television program having similar characteristics to characteristics of a previously watched television program. 50
10. The method of claim 8 wherein, when television program-descriptive text accompanies said channel guide list, includes the further step of: 55
  - performing a search of said television program-descriptive text for a particular text string

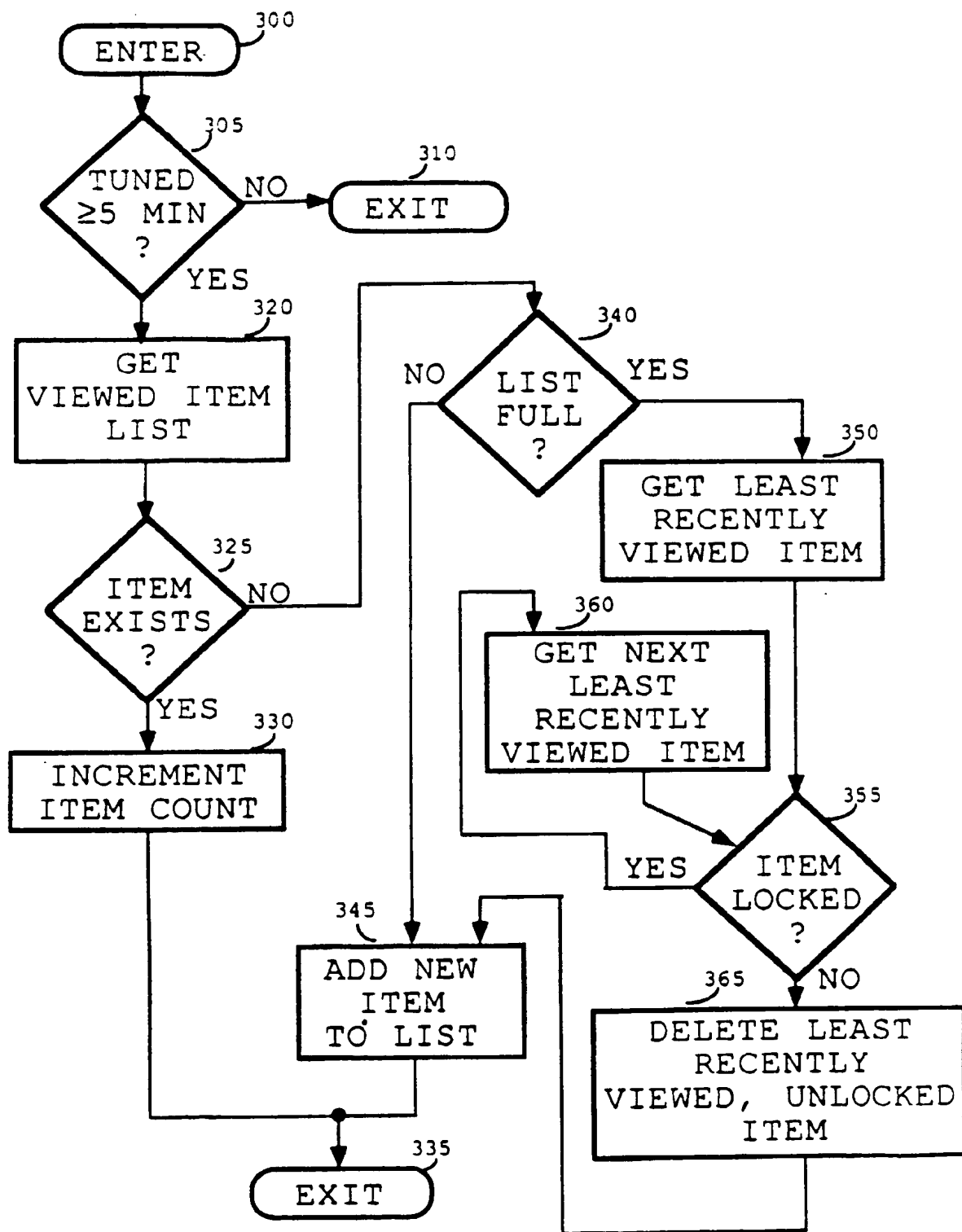
CH150		Program Guide				7:05pm		
		7:00pm						
HBO 102	OTHER PEOPLE'S MONEY		<div><div>MOVIE TITLE: STARRING: PRODUCER: RATING: THEME: REVIEW:</div><div>ZULU STANLEY BAKER &amp; MICHAEL CAINE STANLEY BAKER PG-13 (VIOLENCE) ACTION/ADVENTURE ☆☆☆<math>\frac{1}{2}</math></div><div>PLOT: A VASTLY OUTNUMBERED COMPANY OF BRITISH SOLDIERS IN LATE 19TH CENTURY SOUTH AFRICA DEFENDS AN ISOLATED OUTPOST AGAINST AN ATTACK BY 40,000 ZULU WARRIORS.</div></div>					
CBS 106	EVENING NEWS	FRATERNITY						
UPN 113	STAR TREK: VOYAGER							
CINE 210	CINE SATURDAY NIGHT MOVIE:						ZULU	
CNN 305	PRIME NEWS	BOTH SIDES					RELIABLE SOURCES	WORLD NEWS
USA 422	COUNTER STRIKE		QUANTUM LEAP					
MORE		MOVIES	SPORTS	OTHER	ALL	EXIT		

Fig. 1

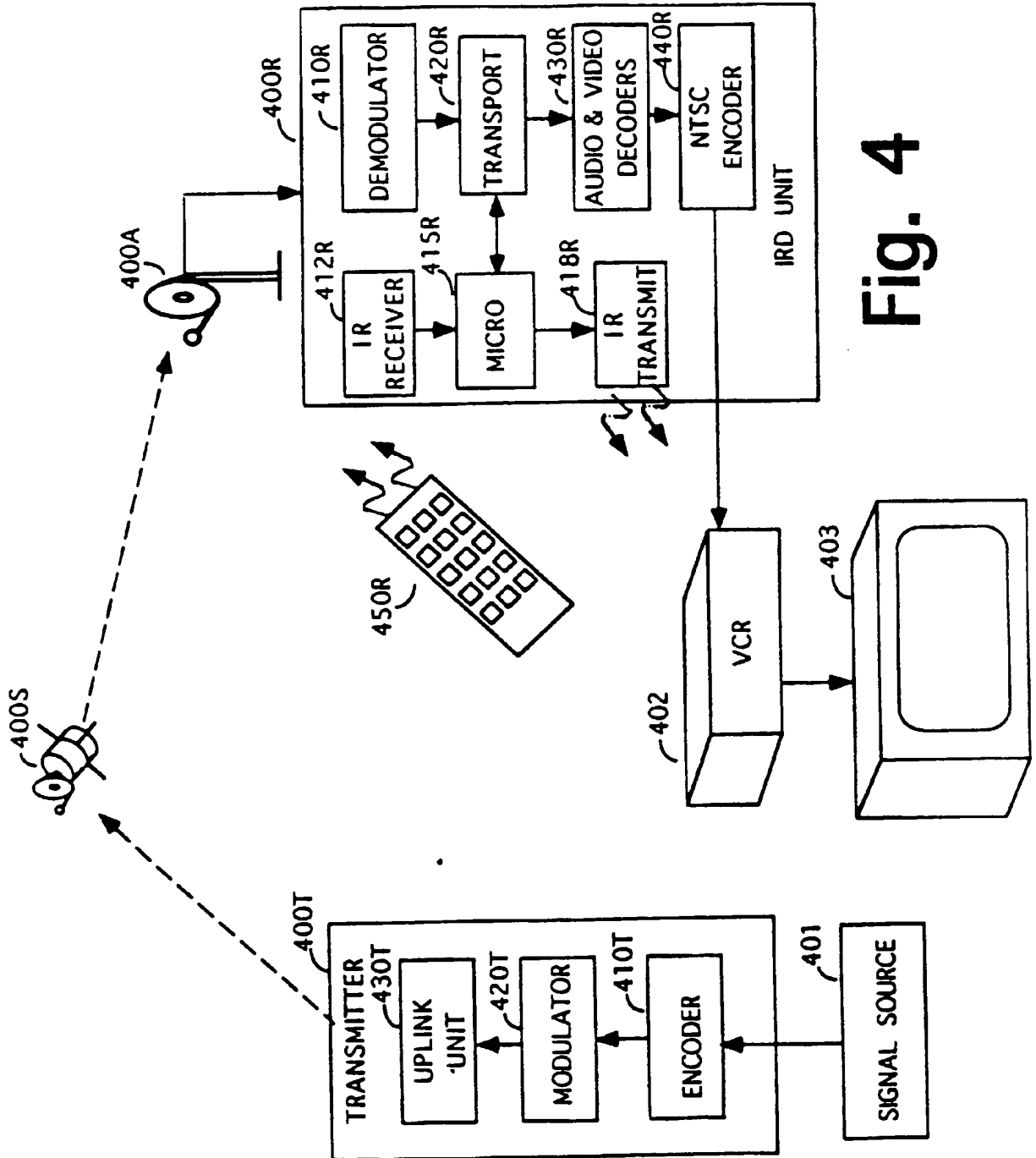
210

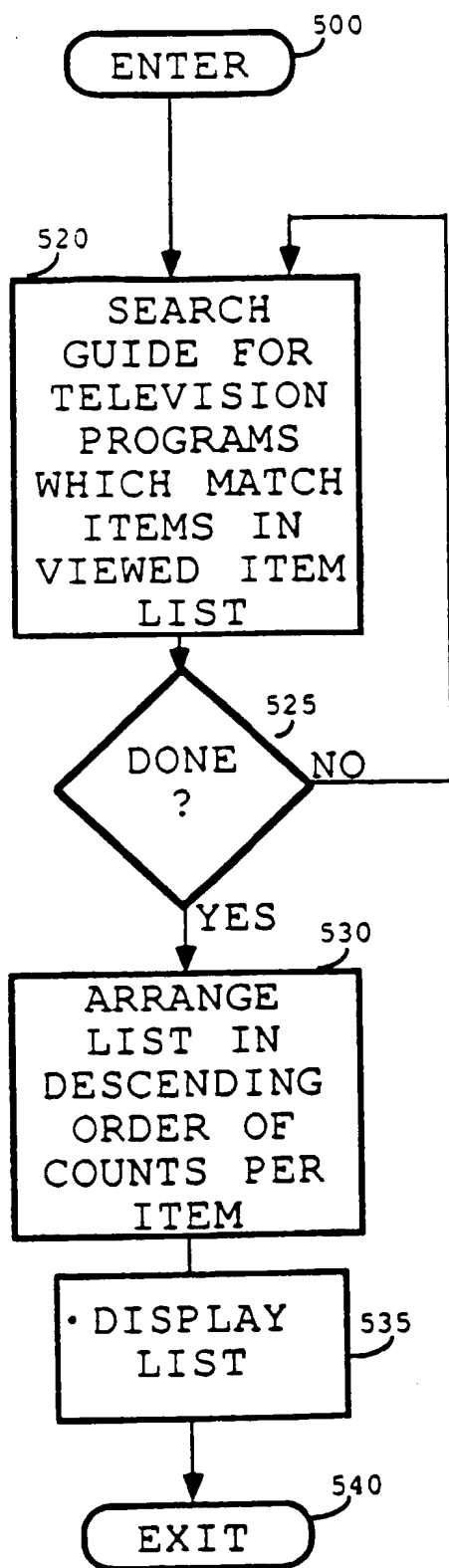
NAME	COUNT	TYPE	DATE	LOCK
movie	7	topic	11.15.95	no
comedy	3	theme	11.15.95	no
drama	4	theme	09.27.95	no
The Simpsons	21	title	10.23.95	yes

**Fig. 2**

**Fig. 3**





**Fig. 5**

Exit	Help
Request a Suggestion	
Edit User Information	

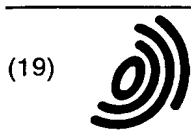
Fig. 6a

Exit	Help	Suggestions	
Tune to Program		Annie Hall	- Bravo
Record Program		The Simpsons	- Fox
		X-Files	- Fox
		Top Hat	- AMC

Fig. 6b

Exit	Help	User Information	
Delete Item		The Simpsons	- 21 cnts
Lock Item		Movie/Comedy	- 12 cnts
		X-Files	- LOCKED - 2 cnts
		Movie/Drama	- 10 cnts
		Undesired Show	- 1 cnt

Fig. 6c



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European Patent Office  
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(11) **EP 0 774 866 A3**

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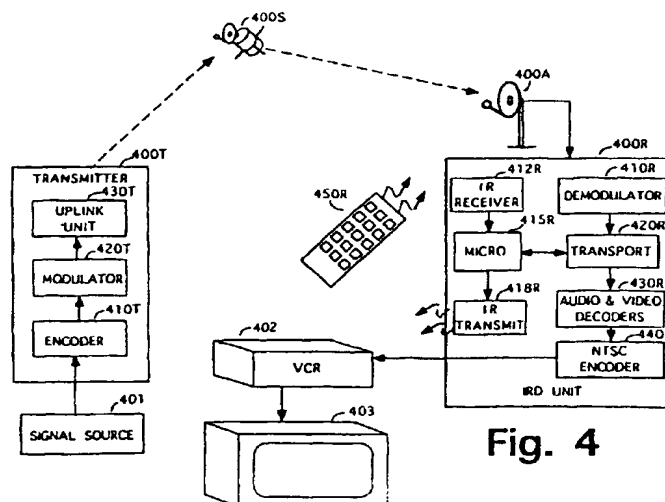
- **Miller, Robert Howard, Thomson Multimedia**  
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(54) **A scheduler apparatus for use in a television receiver**

(57) In a television system in which at least program title information for programs which are to be transmitted in the future is transmitted in advance to form a channel guide listing, apparatus is provided for searching for specific television programs which satisfy certain criteria concerning a user's viewing preferences, and upon successful conclusion to the search, the apparatus gener-

ates a list of such television programs in order to predict for the viewer certain programs which may be of interest. In a first embodiment of the invention the apparatus stores information about the particular television shows which the user watches, as search criteria. In a second embodiment of the invention the search criteria is editable by the viewer to further refine the searches.



**Fig. 4**

**EP 0 774 866 A3**



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 96 40 2396

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	WO 95 01057 A (APPLE COMPUTER INC.) * page 7, line 9 - line 15 * * page 54, line 6 - page 56, line 6 * ---	1-10	H04N5/44 H04N5/445
Y	EP 0 682 452 A (MICROSOFT CORPORATION) * column 15, line 33 - column 16, line 31 * ---	1-10	
A	US 5 353 121 A (YOUNG P. ET AL) * the whole document * ---	1-10	
A	EP 0 662 769 A (AT & T CORP) * column 2, line 5 - line 14 * ---	1-10	
A	EP 0 572 090 A (PHILIPS ELECTRONICS N.V.) * the whole document * -----	1,9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			H04N
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 15 July 1997	Examiner Verschelden, J
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date U : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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(11)

**EP 0 774 866 B1**

(12)

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(21) Application number: **96402396.4**

(22) Date of filing: **12.11.1996**

(54) **A scheduler apparatus for use in a television receiver**

Vorrichtung zum Programmieren eines Fernsehempfängers

Dispositif programmeur pour un téléviseur

(84) Designated Contracting States:  
**DE FR GB IT**

(30) Priority: **15.12.1995 US 573113**  
**17.11.1995 US 6888**

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**92648 Boulogne Cédex (FR)**

(56) References cited:  
**EP-A- 0 572 090 EP-A- 0 662 769**  
**EP-A- 0 682 452 WO-A-95/01057**  
**US-A- 5 353 121**

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

**EP 0 774 866 B1**

## Description

[0001] The subject invention concerns apparatus for scheduling the selection of a television program for watching or recording at some future date.

[0002] The act of selecting a television program to watch has become more complicated in that the number of available channels has increased dramatically of late. For example RCA® DSS® direct broadcast satellite receivers provide as many as 150 channels to choose from. Heretofore, a user who wanted to see "what's on" could merely consult a television schedule printed in his local newspaper in the hope that he would eventually find a program which sparked his interest.

[0003] Such a practice may work well when there are only a few television channel schedules to examine, however, it is unlikely that a viewer would be able to examine the complete schedules for 150 television channels, just to see "what's on" at a given time. Such a task would be daunting even if all of the programs were to be listed by category. A viewer may find that there are only a few programs of interest to him out of the vast number of available programs. That is, the chaff outnumbers and tends to hide the wheat. Consequently, it is felt that as the number of channels increases, the chances of successfully locating a desirable program in a short time becomes more and more unlikely.

[0004] The document EP 0 572 090 A2 describes a system and a method for automatically correlating user preferences with a television program information database.

[0005] An object of the invention is a method of selecting a television program comprising the steps of

searching a stored program guide for a television program matching data representing characteristics of television programs previously watched by a user;  
upon completion of said searching, notifying said user of an availability of a matched television program

characterized in that it comprises the step of:

storing automatically data representing characteristics of television programs previously watched by a user, said data being capable of being manually changed in response to a user input.

[0006] According to a particular embodiment, the data representing characteristics of television programs may relate to topic, title, date, theme, or frequency of watch information.

[0007] According to a particular embodiment, the program guide comprises television program descriptive text which may relate to title, star, director or context of a television program, and said searching step including a search of said television program descriptive text.

[0008] According to a particular embodiment, the invention further comprises the step of providing a user with the option of recording the matched program.

5 [0009] According to a particular embodiment, the notifying step includes the step of producing a display of a list of television programs having similar characteristics to a previously watched television program.

[0010] FIGURE 1 is an illustration of a screen display, in accordance with an aspect of the invention.

10 [0011] FIGURE 2 is an illustration of a screen display showing a viewed item list in accordance with another aspect of the invention.

[0012] FIGURE 3 is a flowchart useful in understanding the invention.

15 [0013] FIGURE 4 is an illustration in block diagram form of apparatus suitable for use with the invention.

[0014] FIGURE 5 is a flowchart useful in understanding the invention.

20 [0015] FIGURES 6a-6c are illustrations of screen displays produced in accordance with the invention.

[0016] Television systems such as the RCA® DSS® direct broadcast satellite system and Starsight® transmit channel guides for display on the television receivers of subscribers.

25 [0017] FIGURE 1 shows a Program Guide screen display 110 produced, for example, by an RCA® DSS® direct broadcast satellite receiver system, manufactured by Thomson Consumer Electronics, Inc. Indianapolis, IN. A user selects a television program from a Program Guide for viewing, by moving a cursor (via operation of remote control up, down, right, and left, direction control keys, not shown) to a block of the program guide screen display which contains the name of the desired program. When a SELECT key of the remote control is pressed, the current x and y position of the cursor is evaluated to derive virtual channel and program time information. In this example of FIGURE 1, a particular television show, CINE SATURDAY NIGHT MOVIE: ZULU has been highlighted for selection by use of the cursor keys on a remote control unit (e.g., 450R of FIGURE 4). The highlighting is illustrated by the dark box outlining the title in FIGURE 1. Normally, upon pressing the select key, the relevant programming data is transferred to a programming unit. Note also that an auxiliary text display 120 is shown. Auxiliary text display 120 provides additional data relating to the highlighted television program. A further use for the data provided by channel guide screen 110 and auxiliary text display 120 will be described below.

35 [0018] FIGURE 2 shows a "predictive agent list" or "viewed item list" which may be generated as a screen display 210. Data is automatically stored in this predictive agent list by the apparatus of the invention, whenever a program is watched for a given period of time, for example, 5 or more minutes. In this way, a record is kept of the user's viewing habits so that the apparatus can be guided to make a prediction of which upcoming shows may be of interest to the viewer.

[0019] A predictive agent list 210 is illustrated in FIGURE 2. In the example of FIGURE 2, the viewer has watched 7 movies, (the television program type "movies" is a broad classification known as a "topic"). The last movie was watched on 15 November 1995. Of these 7 movies there were three movies having the theme "comedy", and four movies having the theme "drama". The last comedy was watched on 15 November 1995, and the last drama was watched on 27 September 1995. The viewer also watched 21 episodes of a television program entitled "The Simpsons". Note that an indication of whether each item is locked or unlocked is also stored in the predictive agent list. A viewer may lock an item to prevent the system from automatically deleting that item, if that particular item has not been watched recently. Moreover, the user may edit the viewed item list in order to provide a better filter for the television programs to be predicted (see FIGURE 6c).

[0020] Automatic loading of the viewed item list is shown in the flowchart of FIGURE 3, wherein the routine is entered at step 300. At step 305, a check is made to see if the tuner has been tuned to the current channel for at least five minutes. If not, the routine is exited at step 310. If so, the routine advances to step 320 to get the viewed item list from memory. At step 325, a check is made to see if an item matching the currently viewed television program already exists in the viewed item list. If so, the count of that item is incremented and the routine is exited at step 335. If an item matching the currently viewed television program does not already exist in the viewed item list, then the routine advances to step 340. At step 340 a check is made to see if the list is full. If not, then data indicative of the currently viewed television program is added to the viewed item list, and the routine is exited at step 335. If, at step 340, it was determined that the viewed item list was full, then at step 350 the routine will read the least recently viewed item of the list. At step 355, a check will be made to see if that item is locked. If so, it means that the viewer does not want that item to be deleted, and the routine loops back to step 360 to get the next least recently viewed item from the list. That item will in turn be checked at step 355 to see if it is locked. If not, the routine will advance to step 365 where that item will be deleted to provide free space in the list. The routine will then advance to step 345, add the new item to the list, and exit at step 335.

[0021] A viewer may request a search to see "what's on" at any given time (see FIGURE 6a). The result of that search will be a list of predictions of television programs which the user might find interesting. Such a list of predictions will be displayed to the user by means of an on-screen display (see FIGURE 6b). The displayed list may be presented in a "weighted" fashion, for example in descending order of the number of times that a particular type of show was watched. Generation of this list of predictions is shown in the flowchart of FIGURE 5.

[0022] As noted above, the channel guide data used

by the controller of the subject apparatus to form the above-described interactive or confirmation sentences may be received from a satellite television communication system. FIGURE 4 shows such a satellite television communication system in which, a satellite 400S receives a signal representing audio, video, or data information from an earth-based transmitter 400T. The satellite amplifies and rebroadcasts this signal to a plurality of receivers 400R, located at the residences of consumers, via transponders operating at specified frequencies and having given bandwidths. Such a system includes an uplink transmitting portion (earth to satellite), an earth-orbiting satellite receiving and transmitting unit, and a downlink portion (satellite to earth) including a receiver located at the user's residence.

[0023] In a such a satellite system, the information necessary to select a given television program is not fixedly-programmed into each receiver but is rather is down-loaded from the satellite continually on each transponder. The television program selection information comprises a set of data known as a Master Program Guide (MPG), which relates television program titles, their start and end times, a virtual channel number to be displayed to the user, and information allocating virtual channels to transponder frequencies and to a position in the time-multiplexed data stream transmitted by a particular transponder. In such a system, it is not possible to tune any channel until the first master program guide is received from the satellite, because the receiver (IRD, or Integrated Receiver Decoder) literally does not know where any channel is located, in terms of frequency and position (i.e. data time slot) within the data stream of any transponder.

[0024] A master program guide is preferably transmitted on all transponders with the television program video and audio data, and is repeated periodically, for example, every 2 seconds. The master program guide, once received, is maintained in a memory unit in the receiver, and updated periodically, for example every 30 minutes. Retention of the master program guide allows instantaneous television program selection because the necessary selection data are always available. If the master program guide were to be discarded after using it to select a television program, then a delay of at least two seconds would be incurred while a new program guide was acquired, before any further television program selections could be performed.

[0025] Once the channel transponder carrying a desired television program is tuned, the data packets containing the audio and video information for that program can be selected from the data stream received from the transponder by examining the data packets for the proper SCID (Service Component Identifier) 12 bit code. If the SCID of the currently received data packet matches the SCID of the desired television program as listed in the program guide, then the data packet is routed to the proper data processing sections of the receiver. If the SCID of a particular packet does not match the SCID of



the desired television program as listed in the program guide, then that data packet is discarded.

**[0026]** A brief description of system hardware, suitable for implementing the above-described invention, now follows. In FIGURE 4, a transmitter 400T processes a data signal from a source 401 (e.g., a television signal source) and transmits it to a satellite 400S which receives and rebroadcasts the signal to a receiving antenna 400A which applies the signal to a receiver 400R. Transmitter 400T includes an encoder 410T, a modulator (i.e., modulator/forward error corrector (FEC)) 420T, and an uplink unit 430T. Encoder 410T compresses and encodes signals from source 401 according to a predetermined standard such as MPEG. MPEG is an international standard developed by the Moving Picture Expert Group of the International Standards Organization for coded representation of moving pictures and associated audio stored on digital storage medium. An encoded signal from unit 410T is supplied to modulator/Forward Error Corrector (FEC) 420T, which encodes the signal with error correction data, and Quaternary Phase Shift Key (QPSK) modulates the encoded signal onto a carrier.

**[0027]** Uplink unit 430T transmits the compressed and encoded signal to satellite 400S, which broadcasts the signal to a selected geographic reception area. The signal from satellite 400S is received by an antenna dish 400A coupled to an input of a so-called set-top receiver 400R (i.e., an interface device situated atop a television receiver). Receiver 400R includes a demodulator (demodulator/Forward Error Correction (FEC) decoder) 410R to demodulate the signal and to decode the error correction data, an IR receiver 412 for receiving IR remote control commands, a microprocessor 415R, which operates interactively with demodulator/FEC unit 410R, and a transport unit 420R to transport the signal to an appropriate decoder 430R within unit 400R depending on the content of the signal, i.e., audio or video information. An NTSC Encoder 440R encodes the decoded signal to a format suitable for use by signal processing circuits in a standard NTSC consumer VCR 402 and standard NTSC consumer television receiver 403. Microprocessor (or microcontroller, or microcomputer) 415R receives infrared (IR) control signals from remote control unit 450R, and sends control information to VCR 402 via an IR link 418R. Microprocessor 415R also generates the on-screen display (OSD) signals needed for presenting the interactive sentence, or confirmation sentence, to the user. Microprocessor 415R also receives and interprets cursor key X and Y information in order to control the highlighting of user choices in the on-screen displays.

**[0028]** The routine for automatic generation of the predictive list is set forth in FIGURE 5. The routine is entered at step 500, and at step 520, a search of the newly received program guide is performed for a match with search terms in the viewed item list of FIGURE 2. Note that the additional program descriptive data 120 of FIGURE 1 is also to be search for a correspondence

with the search terms of FIGURE 2. The search routine loops at step 525 until completed. At step 530, the list is weighted for display. The list of items predicted to be of interest to the viewer is then displayed at step 535, and the program exited at step 540.

**[0029]** FIGURES 6a-6c show screen displays which enable the user to exercise the features of the invention. Specifically, FIGURE 6a is a Predictive Agent Main Menu screen accessed for example via the normal hierarchical menu system of the DSS® satellite television system. The screen display of FIGURE 6a has two "softkeys" labelled "Request a Suggestion" and "Edit User Information", respectively. Selecting "Request a Suggestion" causes a prediction operation to be performed, and brings up the screen display of FIGURE 6b. FIGURE 6b shows the predictions to the user, for example the movie Annie Hall on the Fox channel leads a list of shows predicted to be of interest to this particular viewer. The viewer may highlight one of the items on the list and then either tune to that show or record it. The other choice in the screen display of FIGURE 6a is "Edit User Information". Suppose the viewer had watched a show called (for purposes of this explanation) "Undesired Show". Further suppose that the viewer did not enjoy the show and does not want that show to influence future predictions. By selecting the "Edit User Information" softkey, the screen of FIGURE 6c is brought up for display. The viewer may then highlight the entry for "Undesired Show" and delete it by pressing the "Delete Item" softkey. As noted above, the viewer may also lock a desired entry to keep it from being automatically deleted when space is needed, if that item has a low count, or hasn't been watched recently.

**[0030]** Although the invention was described with reference to a satellite television system, it is equally applicable to ground based television broadcast systems, both digital and analog.

## 40 Claims

1. A method of selecting a television program comprising the steps of

searching a stored program guide for a television program matching data representing characteristics of television programs previously watched by a user;  
upon completion of said searching, notifying said user of an availability of a matched television program

characterized in that it comprises the step of:

storing automatically data representing characteristics of television programs previously watched by a user, said data being capable of

being manually changed in response to a user input.

2. The method of claim 1, wherein the data representing characteristics of television programs may relate to topic, title, date, theme, or frequency of watch information. 5
3. The method of claim 1, wherein the program guide comprises television program descriptive text which may relate to title, star, director or context of a television program, and said searching step including a search of said television program descriptive text. 10
4. The method of claim 1, further comprising the step of providing a user with the option of recording the matched program. 15
5. The method of claim 1, wherein the notifying step includes the step of producing a display of a list of television programs having similar characteristics to a previously watched television program. 20

#### Patentansprüche 25

1. Verfahren zur Wahl eines Fernsehprogramms mit folgenden Schritten:

Suche, in einem gespeicherten Programmführer, nach einem Fernsehprogramm, das Daten entspricht, die Kennwerte von Fernsehprogrammen darstellen, die in der Vergangenheit von einem Benutzer betrachtet wurden, Information des Benutzers über die Verfügbarkeit eines den Daten entsprechendem Fernsehprogramms nach Beendigung der Suche, 30

**gekennzeichnet durch** folgende Schritte: 35

automatisches Speichern der Daten, die Kennwerte von Fernsehprogrammen darstellen, die in der Vergangenheit **durch** einen Benutzer betrachtet wurden, wobei diese Daten aufgrund einer Benutzereingabe manuell geändert werden können. 40

2. Verfahren nach Anspruch 1, wobei die Daten, die Kennwerte der Fernsehprogramme darstellen, sich auf das Thema, den Titel, das Datum oder Informationen für die Häufigkeit der Betrachtung beziehen. 45
3. Verfahren nach Anspruch 1, wobei der Programmführer einen das Fernsehprogramm beschreibenden Text enthält, der sich auf den Titel, den Hauptdarsteller, den Regisseur oder den Kontext eines Fernsehprogramms beziehen kann, und der Suchvorgang in einer Suche des das Fernsehprogramm 50

beschreibenden Textes besteht.

4. Verfahren nach Anspruch 1 mit dem Schritt, daß einem Benutzer die Möglichkeit der Aufzeichnung des angepaßten Programms geliefert wird.
5. Verfahren nach Anspruch 1, wobei der Schritt der Information den Schritt der Erzeugung einer Wiedergabe einer Liste von Fernsehprogrammen enthält, die ähnliche Kennwerte wie in der Vergangenheit betrachtete Fernsehprogramme haben. 55

#### Revendications

1. Méthode de sélection d'une émission de télévision comprenant les étapes :

de recherche, dans un guide mémorisé des émissions, d'une émission de télévision correspondant à des données représentant des caractéristiques d'émissions précédemment regardées par un téléspectateur,

à l'issue de la recherche, de notification au téléspectateur de la présence d'une émission correspondant aux données,

**caractérisée en ce qu'elle** comprend une étape de :

stockage automatique des données correspondant aux caractéristiques d'émissions regardées précédemment par un téléspectateur; ces données pouvant être modifiées manuellement en réponse à une entrée par le téléspectateur.

2. Méthode de la revendication 1, dans laquelle les données correspondant aux caractéristiques d'émissions de télévision peuvent concerner le type, le titre, la date, le genre ou la fréquence de l'émission regardée. 50
3. Méthode de la revendication 1, dans laquelle le guide des émissions comprend une description des émissions de télévision qui peut concerner le type, les acteurs, le réalisateur ou le contexte d'une émission ; l'étape de recherche incluant une recherche de cette description des émissions. 55
4. Méthode de la revendication 1, comprenant, en outre, la possibilité pour l'utilisateur d'enregistrer l'émission répondant aux critères.
5. Méthode de la revendication 1, dans laquelle l'étape de notification comprend l'affichage d'une liste d'émissions de télévision dont les caractéristiques sont similaires à une émission regardée auparavant.

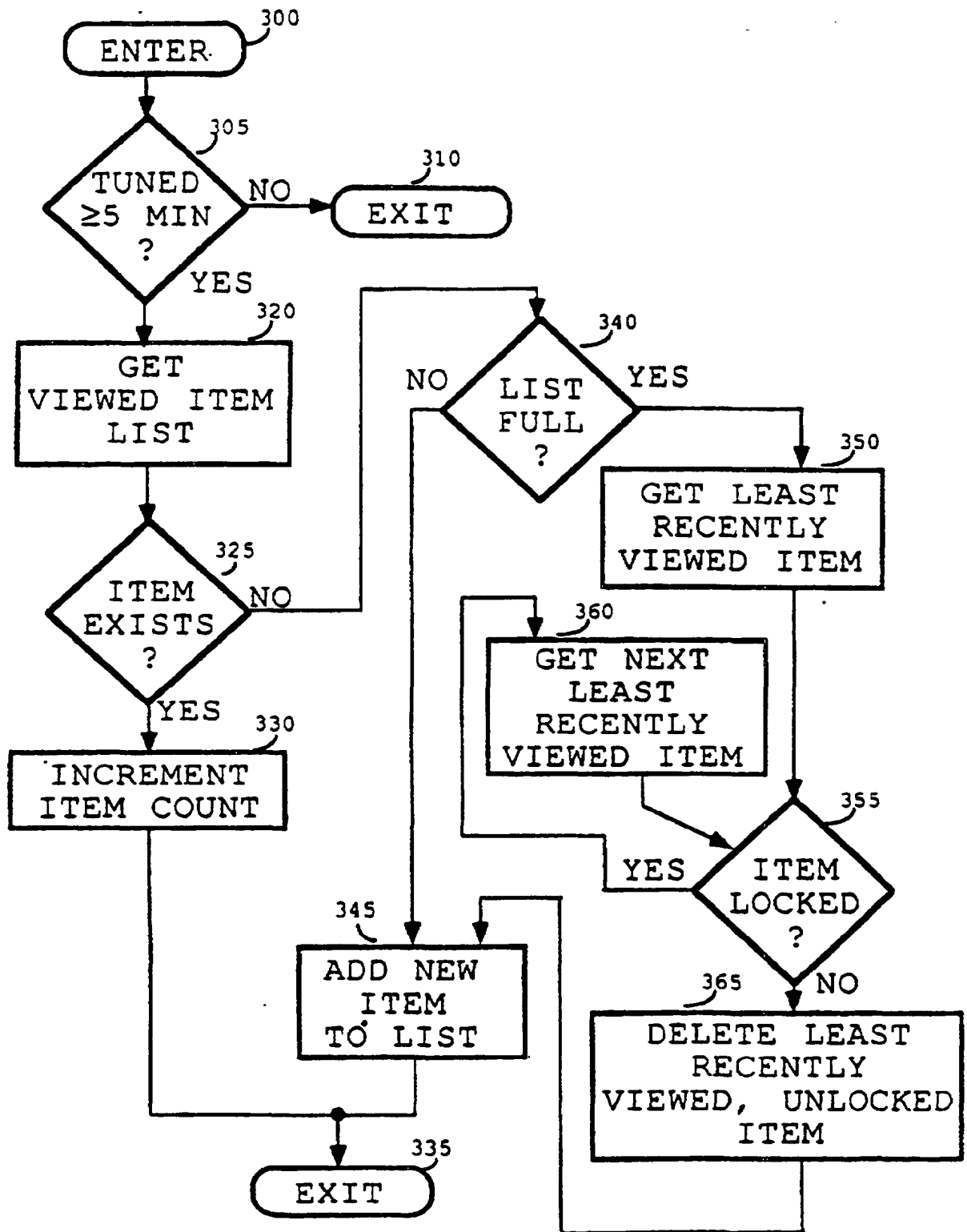
CH150		Program Guide		7:05pm	
		7:00pm		<div>110</div> <div>120</div> <div>MOVIE TITLE: ZULU STARRING: STANLEY BAKER &amp; MICHAEL CAINE PRODUCER: STANLEY BAKER RATING: PG-13 (VIOLENCE) THEME: ACTION/ADVENTURE REVIEW: ☆☆☆<math>\frac{1}{2}</math>  PLOT: A VASTLY OUTNUMBERED COMPANY OF BRITISH SOLDIERS IN LATE 19TH CENTURY SOUTH AFRICA DEFENDS AN ISOLATED OUTPOST AGAINST AN ATTACK BY 40,000 ZULU WARRIORS.</div>	
HBO 102	OTHER PEOPLE'S MONEY				
CBS 106	EVENING NEWS	FR TUR			
UPN 113	STAR TREK: VOYAGER				
CINE 210	CINE SATURDAY NIGHT MOVIE: ZULU				
CNN 305	PRIME NEWS	BOTH SIDES	RELIABLE SOURCES	WORLD NEWS	
USA 422	COUNTER STRIKE		QUANTUM LEAP		
MORE	MOVIES	SPORTS	OTHER	ALL	EXIT

Fig. 1

210

NAME	COUNT	TYPE	DATE	LOCK
movie	7	topic	11.15.95	no
comedy	3	theme	11.15.95	no
drama	4	theme	09.27.95	no
The Simpsons	21	title	10.23.95	yes

**Fig. 2**

**Fig. 3**

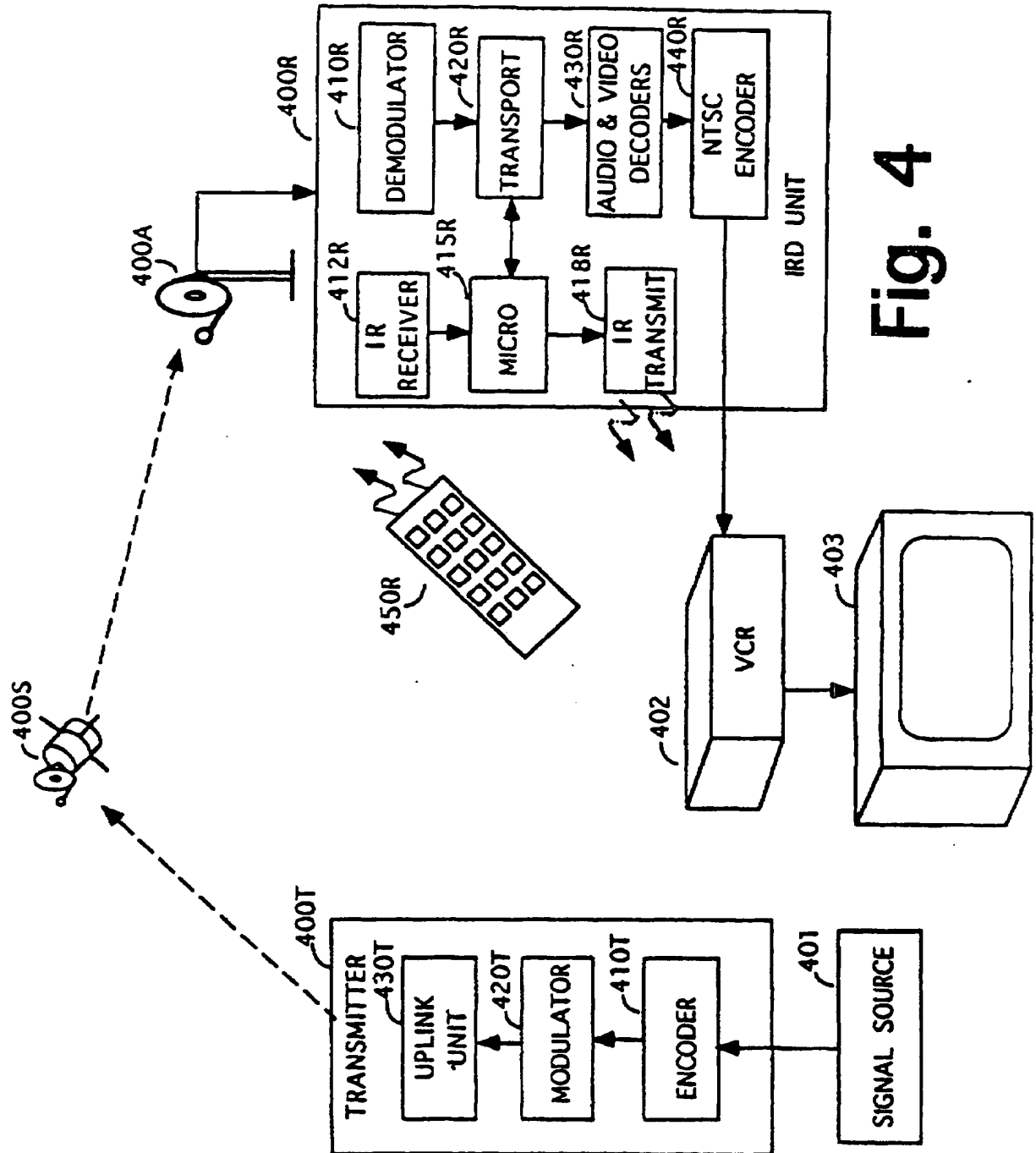
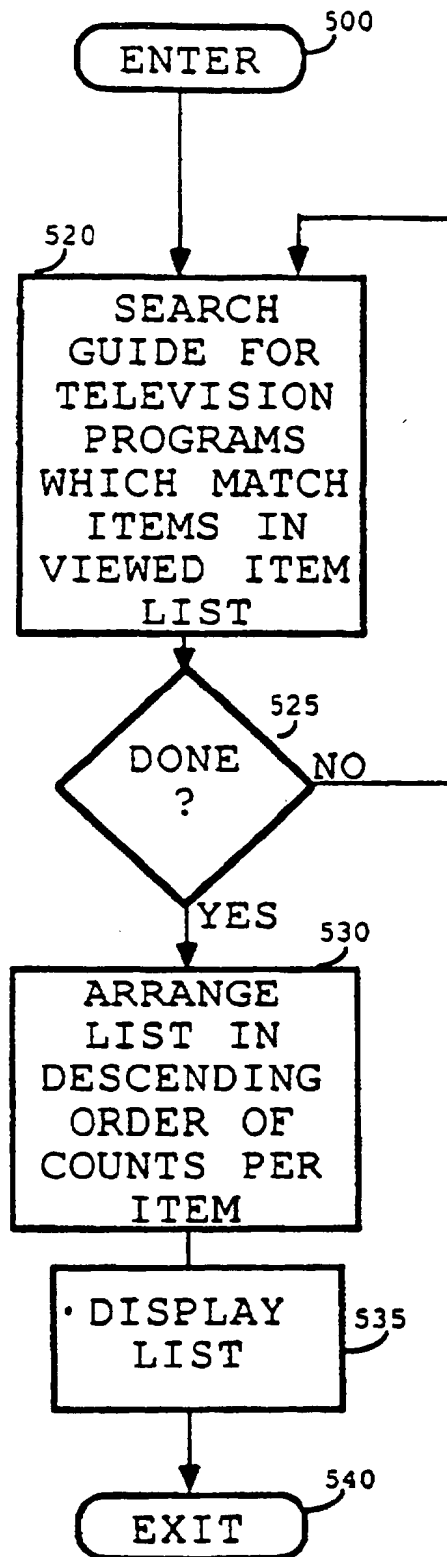


Fig. 4

**Fig. 5**

Exit	Help
Request a Suggestion	
Edit User Information	

Fig. 6a

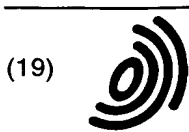
Exit	Help	Suggestions	
Tune to Program		Annie Hall	- Bravo
Record Program		The Simpsons	- Fox
		X-Files	- Fox
		Top Hat	- AMC

Fig. 6b

Exit	Help	User Information	
Delete Item		The Simpsons	- 21 cnts
Lock Item		Movie/Comedy	- 12 cnts
		X-Files - LOCKED	- 2 cnts
		Movie/Drama	- 10 cnts
		Undesired Show	- 1 cnt

Fig. 6c





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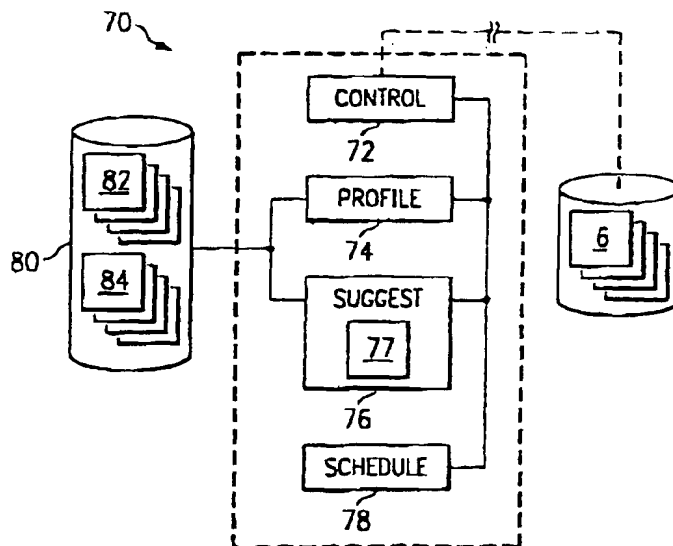
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(54) **Electronic television program guide system and method**

(57) An electronic programming guide (70) operates on a computing platform (12) associated with a television (40). The platform (12) accesses a program listing database (48) containing program listing information (6) for a plurality of television programs. The electronic programming guide (70) includes a profile database (80) that stores a viewer profile (84) and a suggest module (76) that is coupled to the profile database (80). The suggest module (76) accesses the viewer profile (84) and

the program listing information (6) and, in response, generates a preferred schedule (100) according to the viewer profile (84) and the program listing information (6). The preferred schedule (100) indicates the desirability of a particular program relative to other programs. The electronic programming guide (70) may also be used to instruct a recorder (20) to record a television program in accordance with the program listing information (6) and viewer input information that does not specify broadcast information concerning the program.



**FIG. 3**

## Description

### TECHNICAL FIELD OF THE INVENTION

This invention relates in general to the field of television, and more particularly to an electronic programming system and method.

### BACKGROUND OF THE INVENTION

Many television viewers wish to select, schedule, and record their television viewing opportunities to enhance the television viewing experience. To do this, many select programs for viewing after consulting a paper or electronic programming schedule to determine the programs available during particular time slots. Others change from channel to channel in an attempt to locate desirable programming, with varying degrees of success.

As the number of television channels and television programs continues to increase, allowing viewers to more intelligently select, schedule, and record their viewing opportunities becomes increasingly important. An existing technique for electronically accessing program scheduling information includes periodically downloading scheduling information and, in response to requests from the viewer, providing this scheduling information in raw form to the viewer. Even though such techniques may allow the viewer to display only programs of a particular genre, the viewer must still either inspect listing information for programs individually to make informed channel and program choices or waste time "channel surfing" through the programs that are displayed. Because such techniques do not provide any direct channel tuning assistance, they are inadequate to meet the needs of many viewers. Moreover, prior techniques do not allow the viewer to restrict viewing of particular programs or programs having particular characteristics to certain viewers within the household, such as children, without first inspecting a program schedule to determine broadcast information for the programs, such as air dates, start times, stop times, and channels.

Furthermore, electronic program guide (EPG) displays that consider viewer preference information are subject to error, require the viewer to have some understanding of the particular scoring algorithm used, are confusing to viewers that change from one EPG to another EPG, and do not allow for identification of preferred program clustering, which severely limit the ability to accurately and efficiently plan quality viewing time. In addition, prior techniques for recording programs require viewers to input detailed broadcast information, such as air dates, start times, stop times, and channels, or special program codes to record particular programs, are subject to error if a program to be recorded is longer than usual or expected, is preempted, is rescheduled, is changed from one channel to another channel, or otherwise varies from the expectations of the viewer in any

manner, and do not allow viewers to record particular programs or types of programs that the viewers are most likely to enjoy based on viewer preferences or other input information that does not specify broadcast information for the programs. These and other inadequacies make prior techniques unsuitable for many viewers.

### SUMMARY OF THE INVENTION

The present invention addresses the disadvantages and problems previously associated with television viewing and recording.

According to one embodiment of the present invention, an electronic programming guide operates on a computing platform that is associated with a television. The platform accesses a program listing database containing program listing information for a plurality of television programs. The electronic programming guide includes a profile database that stores a viewer profile and a suggest module that is coupled to the profile database. The suggest module accesses the viewer profile and the program listing information and, in response, generates a preferred schedule according to the viewer profile and the program listing information. The preferred schedule indicates the desirability of a particular program relative to other programs.

In another embodiment of the present invention, a method for recording a television program is performed on a computing platform associated with a television and a recorder. Viewer input information is received that does not specify broadcast information concerning the program. Program listing information for a plurality of programs is stored in a program listing database coupled to the platform. The program listing information is accessed and compared to the input information to generate recording information for the program according to the comparison. The recording information for the program is communicated to the recorder to instruct the recorder to record the program.

The electronic programming system and method of the present invention provides a number of important technical advantages. The present invention generates profiles for one or more viewers that are used to score all available programming to determine which programs are most likely to appeal to the viewers. The resulting information is then provided in a simple and understandable format that allows the viewers to more intelligently select, schedule, and record viewing opportunities without inspecting broadcast information for particular programs. The program-based nature of the present invention allows the viewer to tune to more desirable programming at any time during a viewing session and to record particular types of programs at any time before, during, or after a viewing session according to the viewer preference information used to establish the viewer profile. Furthermore, viewers need not block entire channels to restrict viewing of undesirable programs to certain viewers within the household, such as children.

In addition, the present invention allows viewers to record particular programs without providing or even having access to broadcast information such as air dates, start times, stop times, and channels.

#### BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and for further features and advantages thereof, reference is now made to the following description taken in conjunction with the accompanying drawings, in which:

FIGURE 1 illustrates a JAVA-enabled television system according to the present invention;  
 FIGURE 2 illustrates a JAVA-based operating hierarchy according to the present invention;  
 FIGURE 3 illustrates an electronic programming guide according to the present invention;  
 FIGURE 4 illustrates an exemplary preference template according to the present invention; and  
 FIGURE 5 illustrates an exemplary preferred schedule according to the present invention;  
 FIGURE 6 is a flow chart illustrating an exemplary method for selecting a program for viewing according to the present invention; and  
 FIGURE 7 is a flow chart illustrating an exemplary method for recording a television program according to the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

FIGURE 1 illustrates a JAVA-enabled television system 2 that includes a JAVA-enabled television receiver 10 that is associated with a television or other suitable display device 40 and a recorder 20, such as a video cassette recorder (VCR), video disk recorder, or other recording device suitable to record video and audio television signals. Receiver 10 includes a JAVA-based platform 12 that operates on one or more processors 8, such as a digital signal processor (DSP) chip manufactured by TEXAS INSTRUMENTS INCORPORATED, an advanced reduced instruction set computer (RISC) machine (ARM), or any other suitable processing platform. Platform 12 is coupled to the Internet and associated sources of Internet information using a bidirectional link 14. In general, platform 12 provides a collection of application programming interfaces (APIs) that allow platform 12 to synchronize and integrate television signals and Internet information for display on television 40, to support JAVA applets or applications that provide interactive television programming, and to support JAVA applets or applications that provide a wide variety of functionalities related to television programming. In one embodiment, as discussed more fully below with reference to FIGURE 3, platform 12 supports an electronic programming guide JAVA applet or application that allows viewers to more intelligently select,

schedule, and record viewing opportunities according to viewer profiles and information received using link 14. The structure of platform 12 is discussed more fully below with reference to FIGURE 2. Although JAVA is discussed, any other platform independent programming language or other suitable programming language may be used without departing from the intended scope of the present invention.

Link 14 may be any dedicated or switched connection to a public switch telephone network (PSTN), an integrated services digital network (ISDN), a coaxial cable network, a satellite or microwave link, or any other wireless or wireline communications link suitable to couple platform 12 to the Internet. Although the Internet is discussed, the present invention contemplates any global, regional, local, or other suitable computer network coupled to platform 12. Database server 46 coupled to the Internet accesses program listing database 48, which contains television programming information that is periodically updated according to the operation of an organization associated in some manner with server 46 and database 48. In one embodiment, database 48 contains program listing information 6 for each program available for viewing within the next day, week, month, or other specified period from television signal source 26, which may be any suitable cable television system (CATV), direct broadcast satellite system (DBS), regular satellite broadcast system, conventional television broadcast system, or other suitable system for providing television signals to receiver 10.

For each program for which database 48 has listing information, program listing information 6 may include, without limitation: program dates; start times; stop times; a program length; program channels; program genres; a list of actors for the program; a list of sports teams to which the program may relate in some manner; keywords associated with the program that describe the program in some manner; a synopsis of the program; whether the program is a rerun, premiere, finale, mini-series, movie, special, or any other type of program; whether the program is a closed-captioned program; whether the program is in stereo; a Motion Picture Association of America (MPAA) rating or other rating for the program; content information concerning nudity, adult situations, adult language, violence, or other any other type of content; and any other appropriate program listing information 6. An electronic programming guide (EPG) JAVA applet or application running on platform 12 periodically accesses database 48 using link 14 and server 46 to receive program listing information 6 that allows the EPG applet or application to provide television-related functionalities to viewers associated with receiver 10 and television 40, as discussed more fully below with reference to FIGURE 3. Although database 48 is discussed, the present invention contemplates a suitable database integral to receiver 10 and periodically updated by one or more service providers external to receiver 10 using link 14, for example, daily,

weekly, or on any other periodic basis, to include program listing information 6 accessible to platform 12.

Receiver 10 includes one or more tuner/decoders 24 that couple to platform 12 using tuner/decoder control line 22 and receive television signals from source 26, either directly or through recorder 20. Recorder control line 16 couples platform 12 to recorder controller 18 that controls recorder 20 according to the operation of platform 12. One or more audio/video overlays 32 are coupled to platform 12 and coordinate the integration of television signals and Internet information in accordance with the operation of platform 12. A vertical blanking interval (VBI) decoder 28 coupled to tuner/decoder 24 receives decoded television signals from tuner/decoder 24, separates information from the VBI from the decoded television signals, for example, Intercast, closed-captioning, Teletext, or any other VBI information, and communicates the separated VBI information to platform 12. Tuner/decoder 24 also communicates the decoded television signals to audio/video overlays 32 using television line 34. Audio/video overlays 32 communicate outputs to video output 36 and audio output 38.

In one embodiment, video output 36 is a super video (S-video) output with RCA jack cable support or any other suitable video output. Audio output 38 may support any suitable combination of mono, stereo, surround, or other audio information. Video output 36 and audio output 38 are coupled to television 40, although the present invention contemplates video output 36 and audio output 38 integral to television 40 in accordance with the design of receiver 10 and system 2. Input device 42 includes a remote control touch screen, mouse, keypad, or other suitable pointer to communicate infrared, electronic, or other input signals to input receiver 44 of receiver 10. Components of receiver 10 may be at one or more locations integral to or separate from television 40, such as a set top box, a network computer or other processing device, or any other component coupled to television 40.

In operation of system 2, tuner/decoder 24 receives a television signal from source 26, either directly or using recorder 20, and decodes the television signal as necessary or appropriate. In one embodiment, multiple tuner/decoders 24 are used to provide images suitable for a television picture display. Before, during, or after tuner/decoder 24 receives the television signal from source 26, a viewer associated with television 40 selects a particular channel for viewing, using input device 42 or in any other suitable manner. Tuner/decoder 24 communicates a decoded television signal corresponding to the selected channel to audio/video overlays 32 and VBI decoder 28, which in turn communicates the separated VBI information to platform 12. More or less simultaneously, platform 12 receives Internet information using link 14 for integration with the decoded television signal according to a JAVA applet or application operating on platform 12. Also operating on platform 12 is an elec-

tronic programming guide JAVA applet or application that provides various functionalities that allow viewers to more intelligently select, schedule, and record viewing opportunities according to viewer profiles and information retrieved from database 48, as discussed more fully below with reference to FIGURE 3.

Platform 12 contains channel mapping information that associates the television signal for each channel with one or more uniform resource locators (URLs) used for accessing Internet information corresponding to the channel. For example, if the viewer selects the CABLE NEWS NETWORK (CNN) for viewing, platform 12 might use the channel mapping information to associate the channel carrying CNN with a URL for an Internet web site associated with CNN, such as <http://www.cnn.com>. Using the URL and other appropriate information, platform 12 retrieves the associated web page using Internet link 14. Audio/video overlays 32 integrate the web page, any appropriate VBI information received from VBI decoder 28, and the television signal for the selected channel received from tuner/decoder 24 according to the JAVA applet or application operating on platform 12 that controls the integration of this information. Audio/video overlays 32 then communicate the integrated information to television 40 using video output 36 and audio output 38 for viewing.

Typical integration of television signals and Internet information might result visually as the regular television broadcast in a first display area on television 40 and the Internet information in a second display area on television 40. In one embodiment, platform 12 allows the first and second display areas to be moved, sized, merged, blended, overlaid, or manipulated according to the corresponding JAVA applet or application to provide more sophisticated collective displays than were possible using prior systems. The present invention contemplates communicating a URL or other Internet information corresponding to a channel from source 26 using the VBI associated with the particular television signal for the channel. VBI decoder 24 would decode and communicate this information to platform 12, which would then access the appropriate URL using Internet link 14 to retrieve Internet information for integration with the television signal. Other suitable arrangements for obtaining a URL or other information necessary to allow platform 12 to integrate television signals and Internet information are contemplated, without departing from the intended scope of the present invention.

Since the web page that platform 12 accesses using the URL and integrates with the television signals for the corresponding channel may provide information relating to the subject matter of the television program, the viewer is able to interact with one medium to conveniently access a great deal of information concerning a topic. In addition, the Internet information that platform 12 synchronizes and integrates with the corresponding television signals may include information regarding other related web sites, an associated chat room in which the

viewer might discuss the program with other viewers during the program, or any other Internet information. During a commercial break in the program, information regarding the advertised product might be retrieved from a web site associated with the product and syn-

chronously and integrally displayed along with the commercial. In addition, as discussed more fully below with reference to FIGURE 3, platform 12 supports a JAVA-based electronic programming guide (EPG) that allows one or more viewers to more intelligently select, schedule, or record viewing opportunities according to viewer profiles and program listing information 6 to enhance the television viewing experience.

FIGURE 2 illustrates an exemplary JAVA-based operating hierarchy 50 for system 2 and platform 12 that includes a number of levels, each containing a collection of hardware, software, or both hardware and software suitable to perform the functions of system 2 and platform 12. First level 51 includes conventional television-related hardware 52, such as recorder controller 18, tuner/decoder 24, VBI decoder 28, video output 36, audio output 38, input receiver 44, and any other suitable hardware and software associated with receiver 10, recorder 20, and television 40. Second level 53 of hierarchy 50 includes one or more interactive television protocols 54, for example, Digital Audio/Video Interactive Decoder (DAVID) and Interactive Communications Applications Protocol (ICAP). Third level 55 of hierarchy 50 includes a basic JAVA operating system 56 with JAVA RUN-TIME, which implements the JAVA VIRTUAL MACHINE to provide various low level JAVA capabilities such as windowing, networking, and file management, together with appropriate JAVA extensions that augment basic JAVA APIs and associated classes according to the functionalities associated with platform 12. One such functionality, as discussed more fully below, is supporting an electronic programming guide JAVA applet or application that allows viewers to select, schedule, and record viewing opportunities according to viewer profiles and program listing information 6 retrieved from database 48.

Fourth level 57 includes a JAVA toolkit 58 having a collection of APIs 60 that cooperate with JAVA operating system 56 to allow JAVA applets 64 and applications 62 in fifth level 59 to perform functionalities associated with JAVA applets 64 and applications 62. In one embodiment, APIs 60 of toolkit 58 allow platform 12 to support JAVA applets 64 downloaded from the Internet over link 14, JAVA applications 62 installed locally on receiver 10 or any processing platform associated with receiver 10, or any other appropriate JAVA program that uses the television-related functionalities of APIs 60. Since toolkit 58 and APIs 60 are designed to support any appropriate JAVA applet 64 or application 62, the viewer is not limited to applets 64 or applications 62 from particular content developers, but may download any JAVA applet 64 or install any JAVA application 62 that provides the desired functionality without concern regarding compatibil-

ity with platform 12. Furthermore, toolkit 58 allows developers to write applets 64 and applications 62 that presume an ability on the part of platform 12 to integrate television signals and Internet information, to provide interactive television programming, to allow viewers to more intelligently select, schedule, or record viewing opportunities according to viewer profiles and program listing information 6, and to support any other suitable television-related functionality.

In one embodiment, each API 60 includes a collection of JAVA functions and supporting classes that are related to a particular task or combination of associated tasks and extend the basic JAVA APIs discussed above. For example, a control API 60 contains classes that support functions to integrate television signals into JAVA applets 64 and applications 62 as discussed above. Control API 60 also includes classes that control video and audio properties associated with television 40, for example, and not by way of limitation: controlling television overlay operations, such as color overlay keying to overlay JAVA animations; setting channel numbers; setting the position, width, and height of the television signal video component within an integrated display; turning the video or audio on or off; freezing or unfreezing the video; setting video brightness, contrast, color, or tint; setting audio volume, balance, bass, and treble; and any other suitable property related to the information presented on television 40.

In addition, control API 60 may include classes that define mapping between channel numbers, identifiers, and associated URLs; associate electronic program guides with channels; represent data streams transmitted in the VBI associated with channels; update the integrated displays presented on television 40 according to changes in content on the associated channels; and perform any other activity associated with the incorporation of television signals into the JAVA environment of platform 12. For example, with respect to updating integrated displays, if a program switches to a commercial break, control API 60 may cause a web page or other Internet information associated with the advertised product to be displayed on television 40 in synchronization with the displayed commercial to provide additional product information or an opportunity to order or comment on the product. URLs and other appropriate information communicated in the VBI may cooperate to allow platform 12 to provide mapping functionality. Control API 60 also includes classes for controlling various operations of recorder 20, for example, starting, stopping, playing, recording, pausing, fast-forwarding, and rewinding. The present invention contemplates any classes suitable to allow control API 60 and platform 12 to support television-related JAVA applets 64 and applications 62, regardless of the content developer or particular operation.

Toolkit 58 may include a datacast API 60 that includes classes to support access to data communicated along with the television signals from source 26, such

as Intercast, closed-captioning, Teletext, and other VBI information. A showlet API 60 of toolkit 58 includes classes that support interactive television programming, such as for shopping, advertising, polling, distance learning, participation in game shows, banking, and any other interactive programming. As discussed above, since toolkit 58 and associated APIs 60 of platform 12 support JAVA applets 64 and applications 62 having any appropriate operation, the number of interactive programming opportunities that platform 12 and system 2 provide is virtually limitless.

Toolkit 58 also includes an electronic programming guide (EPG) API 60 that contains classes for querying for, retrieving, and manipulating program listing information 6 contained in program listing database 48, constructing and modifying viewer profiles according to viewer preferences, constructing electronic scheduling displays according to viewer profiles and selected program listing information 6, and providing other desirable functionalities that allow viewers to more intelligently select, schedule, and record viewing opportunities. An EPG applet or application 70 that operates using EPG API 60 and other APIs 60 of toolkit 58 in accordance with the present invention is discussed more fully below with reference to FIGURE 3. As shown in FIGURE 2, JAVA operating system 56 and toolkit 58 implement platform 12 for running JAVA applets 64 and applications 62 in fifth level 59 of hierarchy 50. Although hierarchy 50 is discussed with discrete levels that run on processor 8 of receiver 10, the present invention contemplates one or more levels that are integral to one another or levels that are distributed to run on separate components of receiver 10 or system 2. Interactive television protocols 54, JAVA operating system 56, and toolkit 58 with associated APIs 60 may be referred to collectively as platform 12.

As an example of the operation of APIs 60, consider an EPG applet 70 that is downloaded from the Internet to run on platform 12. In one embodiment, as discussed below with reference to FIGURE 3, functionality associated with EPG applet 70 includes recording a television program that is scheduled for broadcast on some unspecified date in the future. After EPG applet 70 is downloaded and begins to run, EPG applet 70 calls EPG API 60 and other APIs 60 as appropriate to accomplish specific tasks. To record a particular program, for example, EPG applet 70 might call a routine associated with EPG API 60 that queries program listing database 48 to determine the air date, start time, stop time, and channel on which the particular program is scheduled for broadcast, passing a program name or other program identifier to EPG API 60. EPG API 60 might then periodically query database 48 until the date of broadcast and the current date are identical. After determining that the program is scheduled for broadcast on the current date, EPG API 60 might call a routine associated with control API 60 that sets recorder 20 to record, passing the start time or other information appropriate for initiating re-

cording of the program. Similar operation might occur to stop the recording or perform any other suitable functionality that EPG API 60 and other APIs 60 of toolkit 58 support. Since the calls from EPG applet 70 to APIs 60 and between APIs 60 are resolved at run time in the JAVA environment associated with platform 12, platform 12 is able to support virtually any appropriate EPG applet 70, which provides an important technical advantage. Although EPG applet 70 is discussed, the above discussion would apply equally to a suitable EPG application 70.

FIGURE 3 illustrates JAVA-based electronic program guide (EPG) 70, which may run on platform 12 and processor 8 as a JAVA applet 64 downloaded from the Internet over link 14 or as a JAVA application 62 installed locally on receiver 10 or an associated processing platform. In one embodiment, EPG 70 includes a control module 72, a profile module 74, a suggest module 76, and a schedule module 78 that cooperate to provide various EPG functionalities, as discussed below. According to operation of control module 72, profile module 74, suggest module 76, schedule module 78, and any other appropriate components, EPG 70 uses EPG API 60 to access program listing information 6 in database 48 in cooperation with database server 46, as discussed above with reference to FIGURE 1. The present invention contemplates storing program listing information 6 locally at receiver 10 and periodically updating program listing information 6 to replace or combine with accessing database 48 using link 14. In general, EPG 70 allows a viewer to more intelligently select, schedule, and record viewing opportunities according to program listing information 6 and a viewer profile associated with the viewer.

Control module 72 interfaces with the components of platform 12 and system 2 as necessary to retrieve program listing information 6. For example, if program listing information 6 for a particular program is desired, control module 72 might call a routine associated with EPG API 60 to retrieve the desired program listing information 6 in database 48 corresponding to the program, passing suitable information concerning the program and the desired program listing information 6 to EPG API 60. After the appropriate program listing information 6 is returned, control module 72 communicates program listing information 6 to other components of EPG 70, such as profile module 74 or suggest module 76, according to the operation of these components. Control module 72 also coordinates communications between profile module 74, suggest module 76, and schedule module 78 as appropriate. In one embodiment, control module 72 prompts the viewer for and receives a viewer identity in response to the viewer turning on television 40 or in some other manner accessing the resources of EPG 70.

Profile module 74 receives preference information from one or more viewers associated with receiver 10, such as multiple viewers within a family that owns JAVA-

enabled television system 2, and constructs, builds, or otherwise generates corresponding viewer profiles 84 for storage in profile database 80. The present invention contemplates each viewer having a separate viewer profile 84, one or more viewers, such as children, having a combined viewer profile 84, or any other suitable arrangement with respect to viewer profiles 84. Furthermore, one or more viewer profiles 84 may be added, deleted, modified, inactivated, reactivated, or otherwise manipulated at any time according to operation of EPG 70. Profile database 80 may include one or more databases, files, lists, or other arrangement of information at one or more locations that are integral to or separate from receiver 10.

In one embodiment, profile database 80 also contains one or more preference templates 82 that profile module 74 may access and communicate to a viewer using control module 72 to receive preference information from the viewer. For example, EPG 70 may communicate one or more preference templates 82 to a viewer in response to the viewer pointing to, clicking on, or otherwise selecting a profile set-up option that EPG 70 displays on television 40 as part of a windowing menu associated with EPG 70. The viewer might then select a particular preference template 82 to begin constructing or modifying viewer profile 84 associated with the viewer. The present invention contemplates viewers interacting with EPG 70 in any suitable manner to select preference templates 82. EPG 70 may also allow the viewer to use input device 42 to hyperlink between templates 82 or viewer profiles 84 displayed on television 40 according to the operation of EPG 70 and particular needs.

Preference templates 82 stored in profile database 80 may include, without limitation: a genre template 82 that lists possible program genres, for example, drama, horror, comedy, romance, or other program genre; an actor template 82 that lists actors that may appear in a program; a sports team template 82 that lists sports teams to which a program may relate in some manner, for example, if the program is an athletic contest, a documentary, or other sports-related programming; a keyword template 82 that lists keywords that may describe the program in some manner, for example, non-stop, heart-warming, exciting, romantic, or other suitable keywords; and any other suitable preference template 82 suitable for constructing viewer profile 84 according to preference information associated with the corresponding viewer. Multiple preference templates 82 may include the same or similar options that result in the viewer providing the same or similar preference information. For example, a viewer might select "educational" as a preference using both genre template 82 and keyword template 82. In one embodiment, options given the viewer in connection with templates 82 correspond to program listing information 6 that database 48 may contain currently or at some point in the future, depending on the particular programs for which database 48 con-

tains program listing information 6 and other suitable factors.

For each option presented to the viewer in connection with preference templates 82, preference templates 82 allow the viewer to provide ranking information that EPG 70 uses to generate viewer profile 84 and provide enhanced viewing opportunities according to viewer profile 84, as discussed more fully below. Referring to FIGURE 4, genre preference template 82 includes options 86 and corresponding rankings 88 in any suitable presentation format that is viewable on television 40. In one embodiment, the viewer provides a ranking 88 for each option 86 to indicate the desirability of programming associated with option 86 according to any suitable scale, standard, or other criteria. For example, for each option 86, template 82 might include any number of circles, boxes, or other locations on template 82 that each correspond to a qualitative assessment of the degree to which the viewer will likely enjoy programming associated with option 86.

To provide rankings 88 for options 86, the viewer would simply point to, click on, or otherwise indicate the appropriate locations using input device 42 or in any other suitable manner. Each location may also be associated with a numerical value or weight that quantifies the assessment of the viewer for purposes of scoring programs according to viewer profile 84, as discussed more fully below. For example, if "comedy" option 86 is highly preferable to the viewer, the viewer might indicate the last location to the right in FIGURE 4 to provide ranking 88, which might then have a "10" weight. Similarly, if "drama" option 86 is mildly preferable to the viewer, the viewer might indicate the next to last location to the right to provide ranking 88, which might then have a "3" weight. An option 86 with respect to which the viewer is neutral might get ranking 88 with a "0" weight, an option 86 mildly unpreferable to the viewer might receive ranking 88 with a "-3" weight, and an option 86 highly unpreferable to the viewer might receive ranking 88 with a "-10" weight. The present invention contemplates any evaluation or weighting technique suitable to allow viewers to provide rankings 88 for some or all options 86 associated with template 82.

EPG 70 may allow the viewer to hyperlink to displays that provide additional descriptions, examples, or other suitable information by selecting a particular option 86 using input device 82. Genre template 82 may include an exit window 90 allowing the viewer to exit genre template 82 and return to a preference template menu or any other appropriate menu after providing preference information in accordance with genre template 82. Although genre template 82 is discussed, the present discussion applies equally to any other suitable preference templates 82, such as actor template 82, sports team template 82, or keyword template 82. After the viewer has provided preference information to EPG 70 using the appropriate templates 82, profile module 74 stores the preference information for the viewer in

profile database 80 as a new or modified viewer profile 84 for the viewer. EPG 70 may generate and store viewer profiles 84 for each viewer associated with system 2, may combine one or more viewer profiles 84 in accordance with particular needs, or may generate viewer profiles 84 in any other manner according to preference information that one or more viewers provide to EPG 70.

Suggest module 76 accesses program listing information 6 in database 48, directly or using control module 72, and viewer profiles 84 in profile database 80 to generate a preferred programming schedule that allows viewers to more intelligently select programs that may be desirable for viewing or recording. FIGURE 5 illustrates an exemplary preferred schedule 100 that corresponds to the available television programming between 8:00p.m. and 12:00p.m. on a particular date. Preferred schedule 100 includes channel programming 102, 104, 106, 108, 110, and 112 corresponding to first, second, third, fourth, fifth, and sixth channels, respectively, although the present invention contemplates any number of channels. Channel programming 102, 104, 106, 108, 110, and 112 are referred to generally as channel programming 102 unless otherwise indicated. Each program for which preferred schedule 100 has channel programming 102 may fill some or all of one or more time slots 114, which are each thirty minutes long in the example shown in FIGURE 5, yielding the brick-like appearance of preferred schedule 100. Button 118 on preferred schedule 118 allows the viewer to hyperlink or establish a connection to a preference template menu or a display of viewer profile 84. Preferred schedule 100 is referred to as including channel programming 102, scoring indicators 116 and program scores used to generate scoring indicators 116, as discussed below, and any other suitable information associated with preferred schedule 100. EPG 70 may temporarily or more or less permanently store preferred schedule 100 at any suitable location.

Using viewer profile 84 and an appropriate scoring algorithm 77, suggest module 76 generates a color coded, numerical, or other scoring indicator 116 for each program for which channel programming 102 and preferred schedule 100 contain programming information. Additional textual or other suitable information concerning the program might be associated with scoring indicator 116. In general, scoring indicator 116 visually indicates to the viewer a degree of desirability likely to be associated with a corresponding program, based on viewer profile 84 for the viewer. For example, scoring indicator 116 may include color or shading that overlays textual information concerning the program, such as bright green for a highly desirable program, pale green for a mildly desirable program, yellow for a program that is not likely to be relatively desirable or relatively undesirable, pale red for a mildly undesirable program, and bright red for a highly undesirable program. Any other suitable color gradations may be used. In the alternative, channel programming 102 for desirable programs

might have clear backgrounds for the textual information, channel programming 102 for programs that are neither desirable nor undesirable might have gray backgrounds, and programming information 102 for undesirable programs might be entirely blacked out over appropriate time slots 114. Although the present invention contemplates scoring indicators 116 in any suitable format, in one embodiment the use of coloring provides important technical advantages, as discussed more fully below.

In operation of suggest module 76, control module 72 communicates the viewer identity for the viewer and program listing information 6 for some or all available programs to suggest module 76. In response, suggest module 76 accesses the corresponding viewer profile 84 in profile database 80. For each program, suggest module 76 uses scoring algorithm 77 to generate a program score indicating the desirability of the program to the viewer based on viewer profile 84 and program listing information 6. For example, assume program listing information 6 for a particular program indicated to scoring algorithm 77 that the program genre was comedy, that the program featured actor Bill Cosby, that a keyword associated with the program was "fascinating," and that the program was a closed-captioned rerun starting at 10:00p.m. and ending at 10:30p.m. on the current date on the fourth channel. Ranking 88 for "comedy" genre option 86 in viewer profile 84 might be a numeric value, such as "10" or other suitable value, indicating that the viewer strongly prefers comedy programs. Similarly, ranking 88 for "Bill Cosby" actor option 86 might be a "3" or other value indicating that the viewer mildly prefers Bill Cosby programs, and ranking 88 for "fascinating" keyword option 86 might be a "0" or other value indicating that the viewer is neutral regarding programs with which "fascinating" keyword option 86 might be associated.

Still referring to the same example, scoring algorithm 77 might add, average, or otherwise manipulate rankings 88 for the program to determine a score for the program to indicate the degree to which the viewer is likely to enjoy the program, considering all applicable information within program listing information 6 and viewer profile 84, which is likely to be relatively high for this example. In one embodiment, scoring module 77 determines a score for every program for which preferred schedule 100 contains channel programming 102. For programs having scores in a highest percentile range, such as in the highest fifteen percent of scores or any other specified range, suggest module 76 may associate the appropriate colored scoring indicator 116, such as green, clear, or other suitable scoring indicator 116, with the program within preferred schedule 100 to overlay textual information concerning the program. For programs with scores in a middle percentile range, suggest module 76 may associate a yellow, gray, or other scoring indicator 116 with the program. For programs having scores in a lowest percentile range, suggest



module may associate red with the program, black out the program and associated textual information from preferred schedule 100, or provide scoring indicator 116 to the viewer in any other manner to indicate relative undesirability of the programs.

According to the particular scoring algorithm 77, the particular scheme for scoring indicators 116, program listing information 6, and viewer profile 84, the viewer is able to consult preferred schedule 100 to intelligently select from among myriad available viewing opportunities. Since preferred schedule 100 is color coded according to the degree to which programs are likely to be enjoyable, the viewer need not have any understanding or knowledge of scoring algorithm 77, the scores determined for any program or the relationship between the scores determined for any collection of programs, or any other aspect of the manner in which suggest module 76 generates preferred schedule 100. The viewer may specify any suitable correspondence between percentile ranges for program scores and the colors used for scoring indicators 116 to customize EPG 70 in accordance with particular needs. Scoring algorithm 77 may be replaced or modified without altering the functionality of EPG 70 from the perspective of the viewer, because the mapping between the desirability of a program and scoring indicator 116 is consistent, such that the viewer always receives channel programming 102 in a format the viewer can readily understand and appreciate.

Referring again to FIGURE 5, in time slot 114 between 10:00p.m. and 10:30p.m., channel programming 104 for the second channel, channel programming 108 for the fourth channel, and channel programming 112 for the sixth channel all have clear scoring indicators 116, which would overlay textual information for corresponding programs, indicating that the programs on all three of these channels are likely to be enjoyable to the viewer. In contrast, the first, third, and fifth channels have channel programming 102, 106, and 110, respectively, having gray or black scoring indicators 116, as the case may be, which indicates that programs on these channels during this time slot 114 are not likely to be enjoyable to the particular viewer. As a result, if the viewer consults preferred schedule 100 with respect to this time slot 114, the viewer can readily make a determination regarding the channels to select, providing an important technical advantage. In addition, preferred schedule 100 allows the viewer to make more intelligent decisions concerning which time slots 114 are likely to be most suitable for enjoyable viewing in accordance with the arrangement of scoring indicators 116. For example, if the concentration of clear scoring indicators 116 for desirable programs is relatively high in one or more time slots 114, the viewer may plan viewing times for the viewer or other viewers within the household accordingly.

In one embodiment, EPG 70 allows the viewer to point to, click on, or otherwise select channel programming 102 for a particular program to hyperlink or estab-

lish any suitable connection to a display that provides additional factual, descriptive, or other information relating to the program, the associated program listing information 6, the score that scoring algorithm 77 generated for the program, the percentile rank or range for the program associated with the program score, or any other suitable information, in any combination. EPG 70 may allow the viewer to further hyperlink from this display to other displays providing further information concerning selected program listing information 6. For example, if the first display for the program includes a list of actors appearing in the program, the viewer may point to, click on, or otherwise select the name of an actor to hyperlink or establish a connection to a second display providing biographical information for the actor, other programs in which the actor appears, or any other suitable information concerning the actor. EPG 70 may allow the viewer to point to, click on, or otherwise select a particular time slot 114 to receive the program score and other information for some or all programs airing within at least a portion of time slot 114, in descending order from highest to lowest score or any other suitable order. The present invention contemplates any technique for providing the viewer with access to program-related information to allow the viewer to select program viewing and recording opportunities more intelligently to enhance the television-related experience. The viewer may provide an appropriate URL at any time to access the information discussed above from Internet information sources, such as a web page associated with an actor or program.

Furthermore, EPG 70 allows the viewer to change from one channel, whether or not the channel is currently airing a relatively desirable program, to another channel that is currently airing a relatively desirable program at any time during a viewing session. In one embodiment, the viewer presses the "channel up" button or otherwise provides an indication using input device 42 that the viewer wishes to change channels. In response, EPG 70 changes to another channel, for example, the channel airing the program having the highest score relative to the other programs currently airing on other channels, while bypassing channels that are not currently airing a program satisfying the preferences of the viewer currently in effect. Since the viewer can modify the corresponding viewer profile 84 at any time or can select a particular program at any time according to preferences the viewer may provide at any time, the viewer need not consult any printed programming guides to make a viewing decision, which is an important technical advantage of the present invention.

For example, referring again to preferred schedule 100 in FIGURE 5, if the viewer is currently viewing a program on the first channel during time slot 114 between 10:00p.m. and 10:30p.m. and presses the "channel up" button on input device 42, EPG 70 would cause receiver 10 to tune to the sixth channel currently airing a program that is likely to be desirable, as indicated by the

clear scoring indicator 116 associated with channel programming 112 for the sixth channel during time slot 114. Similarly, if the viewer again presses the "channel up" button, EPG 70 would cause receiver 10 to tune to the fourth channel, which is also airing a program having a

clear scoring indicator 116. In this manner, the viewer is able to bypass the program airing on the fifth channel, which is not as likely to be enjoyable to the viewer, as indicated by the gray scoring indicator 116 associated with channel programming 110 for the fifth channel. EPG 70 may also use additional criteria specified by the viewer or otherwise in determining which channel to tune to in response to an indication from the viewer that a channel change is desired. For example, if more than one channel is airing a program with a clear scoring indicator 116 during time slot 114, EPG 70 may cause receiver 10 to tune to the channel airing the program that started most recently. In this case, for the 10:00p.m. to 10:30p.m. time slot 114, the fourth channel would be tuned to first, the sixth channel second, and the second channel third. EPG 70 may use other information to determine which channel to select, for example, the channel airing the program with the highest score, the channel airing a program that is not a rerun, or any other information. The present invention contemplates any suitable technique for selecting one or more alternative channels for viewing at any time during a viewing session.

Since EPG 70 performs a channel selection process that is program-based rather than channel-based, the selection process dynamically adapts as programs aired on the various channels change. For example, during time slot 114 between 10:30p.m. and 11:00p.m., EPG 70 might still preferentially tune receiver 10 to the fourth channel, but would not tune to the sixth channel for which channel programming 112 now includes a black scoring indicator 116 corresponding to a low likelihood that the viewer will enjoy the program. EPG 70 may preferentially select channels for viewing during time slot 114 according to any appropriate combination of program listing information 6 retrieved from database 48 using EPG API 60, link 14, and database server 46.

EPG 70 also allows a viewer to control viewing habits and opportunities for other viewers, such as children in a household, due to the program-based nature of EPG 70 and the functionality that EPG 70 provides. In one embodiment, the parent may filter, block, or otherwise prevent a child from viewing a particular program or type of program that has associated program listing information 6 satisfying a predetermined criterion or set of criteria. For example, if the parent wanted to prevent the child from viewing any program of the "horror" genre, the parent could enter the corresponding preference information using profile module 74 or otherwise, and the child might be required to provide identity information to EPG 70 to access television 40 when the parent was not present. If the child accessed system 2 while HOME BOX OFFICE was airing Halloween, EPG 70 would not

allow the child to tune to the channel corresponding to HOME BOX OFFICE at that time, but would later permit the child to tune to the same channel while HOME BOX OFFICE was airing The Sound of Music or other relatively preferable programming. The parent could also limit the total daily viewing of the child with respect to programs with program listing information 6 satisfying selected characteristics entered using profile module 74 or otherwise. For example, the parent might use EPG 70 to limit the daily viewing of programs of the "cartoon" genre to two hours, after which EPG 70 would not allow the child to select a channel that was currently airing a program of that genre. The program-based nature of EPG 70 provides an important technical advantage over previous systems for providing programming information.

Another important technical advantage of the present invention involves the ability to record programs using recorder 20 in accordance with viewer profiles 84, program listing information 6, or both viewer profiles 84 and program listing information 6, without relying on the viewer to provide information concerning air dates, start times, stop times, or channels for the programs, referred to collectively as broadcast information. Since EPG 70 has access to the resources of database 48 and program listing information 6, if the viewer provides EPG 70 with the title or another suitable identifier for a program, EPG 70 can use EPG API 60 and other components of platform 12 and receiver 10 to cause recorder 20 to record the program regardless of the date, time, or channel on which the program will air. For example, if the viewer specifies recording of all episodes of M\*A\*S\*H or another series, EPG 70 will cause M\*A\*S\*H to be recorded even if the channel airing M\*A\*S\*H changes, the time at which M\*A\*S\*H is aired changes, or the length of the M\*A\*S\*H program changes because the program is a season premiere or for any other reason, because EPG 70 continues to maintain access to the appropriate program listing information 6 in database 48. Eliminating the need for the viewer to provide broadcast information is an important technical advantage.

Similarly, the viewer can cause recorder 20 to record all programs associated with particular keyword or other options 86, such as "James Bond" or another suitable keyword option 86, specify that reruns of a program that is otherwise to be recorded are not to be recorded, or specify the recording of programs in any other suitable manner using EPG 70. Scoring algorithm 77 of suggest module 76 may also determine scores for each program available to be recorded according to program listing information 6 and an appropriate profile 84 stored in profile database 80. If the score for a particular program exceeds a predetermined threshold specified by the viewer or otherwise, EPG 70 may cause the program to be recorded even though the viewer had no knowledge that the program would be airing or even that the program existed. EPG 70 may record programs using

one or more recorders 20. For example, if recorders 20 are VCRs and EPG 70 supports multiple viewer profiles 84, EPG 70 may cause a program that is relatively desirable for a particular viewer according to associated viewer profile 84 to be recorded using recorder 20 corresponding to the particular viewer. The recording of programs may be periodically modified by inactivating or removing selected viewer profiles 84 from database 80 in accordance with particular needs.

Schedule module 78 of EPG 70 provides a conventional programming schedule in accordance with program listing information 6, but does not include information concerning viewer preferences or other information associated with or determined according to viewer profiles 84. For example, a viewer may point to, click on, or select schedule module 78 using a menu display associated with EPG 70 or in any other suitable manner. In response, EPG 70 may display channel information 102 for various channels over one or more time slots 114, as shown in FIGURE 5 and discussed above with reference to preferred schedule 100, except that scoring indicators 116 are absent from the programming schedule. The present invention contemplates combining the programming schedule associated with schedule module 78 and preferred schedule 100 associated with suggest module 76 in any appropriate manner. Although EPG 70 is discussed with respect to platform 12, the present invention contemplates EPG 70 running on any platform suitable to support JAVA-based operation of EPG 70. The present invention further contemplates one or more modules of EPG 70 being integral to one or more other modules or distributed to operate on processing platforms external to platform 12.

FIGURE 6 is a flow chart illustrating an exemplary method for selecting a program for viewing according to the operation of EPG 70. The method begins at step 200, where the viewer provides viewer preference information to EPG 70 using one or more preference templates 82 and input device 42 or in any other manner. At step 202, profile module 74 receives the viewer preference information, either directly or through control module 72, in the form of rankings 88 corresponding to preference options 86. As discussed more fully above, options 86 may include genre options 86, actor options 86, sports team options 86, keyword options 86, or any other suitable options 86. Profile module 74 generates viewer profile 84 for the viewer at step 204 and, at step 206, stores viewer profile 84 in profile database 80. In one embodiment, viewer profile 84 includes rankings 88 for each preference option 86 to provide an indication of the relative desirability to the viewer of programming that is associated with the particular option 86. Suggest module 76, control module 72, or another suitable component of EPG 70 receives viewer input at step 207, which may include the viewer turning on television 40, accessing EPG 70 in some manner, or otherwise indicating that the viewer wishes to view television programming.

At step 208, suggest module 76 accesses viewer profile 84 in profile database 80 and program listing information 6 in program listing database 48, in cooperation with EPG API 60, link 14, and database server 46.

5 Suggest module 76 may access one or more local databases periodically updated to contain program listing information 6 to replace or combine with accessing database 48. Suggest module 76 may access program listing information 6 for all programs airing on a particular date, within one or more time slots 114, or any other set of programs. At step 210, suggest module 76 and associated scoring algorithm 77 calculate, determine, or otherwise generate a program score for each program according to viewer profile 84 and program listing information 6. At step 212, suggest module 76 generates preferred schedule 100 having channel programming 102 for appropriate time slots 114. In one embodiment, a scoring indicator 116 is associated with each program for which preferred schedule contains channel programming 102, in the form of a color overlaying textual information concerning the program or in any other format.

Suggest module 76 may receive an indication at step 214 that a program change is appropriate. For example, the indication may include the viewer pressing a "channel up" button on input device 42 or providing any other suitable indication. Alternatively, if the viewer is a child, the parent may have instructed EPG 70 to prevent the child from viewing programming of a particular genre. The indication may include the child selecting a channel currently airing a program having the undesirable genre or the ending of a desirable program airing on a channel that subsequently begins to air a program having the undesirable genre. If the indication is received at step 214, suggest module 76 selects a program at step 216 that is more likely to be desirable, according to program scores for the other programs for which preferred schedule 100 contains channel programming 102, and the method ends. If the indication is not received at step 214, viewing continues as before and the method ends. Steps 200 through 216 may be repeated as many times and in any relative order as appropriate to allow viewers to modify viewer profiles 84, to select an alternative program for viewing during a viewing session, or to otherwise implement any of the functionalities that EPG 70 supports.

FIGURE 7 is a flow chart illustrating an exemplary method for recording a television program according to the operation of EPG 70. The method begins at step 300, where the viewer provides viewer input information to EPG 70. In one embodiment, the input information may include a program identifier for the program to be recorded, such as a title for the program, any preference option 86 discussed above, or any combination of a program identifier and one or more preference options 86. Since EPG 70 is program-based, the input information need not include broadcast information, such as an air date, start time, stop time, or channel. Since EPG 70 is able to cause recorder 20 to record any program using

a program identifier for the program, without information from the viewer regarding the air date, start time, stop time, or channel, preference information may not be necessary. In the alternative, the viewer may instruct EPG 70 to cause recorder 20 to record all previously unidentified programs satisfying viewer profile 84, in which case input information would include at least some viewer preference information. Suggest module 76 receives the input information at step 302, directly or through control module 72 or any other suitable component of EPG 70.

Suggest module 76 accesses program listing information 6 at step 304 stored locally or in database 48 using EPG API 60, link 14, and database server 46. At step 306, suggest module 76 compares the input information, such as the program identifier or viewer profile 84 generated using the preference information for the viewer, with program listing information 6 in database 48. In accordance with the comparison performed at step 306, suggest module 76 generates recording information for the program at step 308. For example, if a program for which database 48 contains program listing information 6 satisfies a predetermined threshold score associated with viewer profile 84, then suggest module 76 may generate the recording information for the program to cause the program to be recorded.

The recording information may include any instruction or set of instructions suitable to cause recorder 20 to record the program, such as an air date, start time, stop time, channel, or other information relating to the airing of the program. The present invention contemplates the recording information being an instruction to EPG API 60, control API 60, or another component of platform 12 to initiate recording of the program. At step 310, suggest module 76, control module 72, or another component of EPG 70 communicates the recording information for the program to EPG API 60, control API 60, or any other appropriate component of platform 12 or system 2 to instruct recorder 20 to record the program, and the method ends. The present invention contemplates the steps illustrated in FIGURES 6 and 7 cooperating in any suitable manner to allow one or more viewers to more intelligently select, schedule, and record viewing opportunities according to operation of EPG 70 and system 2.

Although the present invention has been described with several embodiments, a plethora of changes, substitutions, variations, alterations, transformations, and modifications may be suggested to one skilled in the art, and it is intended that the present invention encompass such changes, substitutions, variations, alterations, transformations, and modifications as fall within the spirit and scope of the teachings disclosed herein.

## Claims

1. An electronic programming guide for computing

platform associated with a television, the platform operable to access a program listing database containing program listing information for a plurality of television programs, the electronic programming guide comprising:

a profile database for storing a viewer profile; and  
a suggest module coupled to the profile database for accessing the viewer profile and the program listing information and, in response, to generate a preferred schedule according to the viewer profile and the program listing information, the preferred schedule indicative of the desirability of a particular program relative to other programs.

2. The electronic programming guide of Claim 1, further comprising a profile module for receiving viewer preference information and, in response, for generating the viewer profile.
3. The electronic programming guide of Claim 2, wherein the profile module is operable to provide a preference template to the viewer for receiving the viewer preference information.
4. The electronic programming guide of any preceding Claim, wherein the viewer profile includes a ranking corresponding to an option selected from the group consisting of:
  - a genre option;
  - an actor option;
  - a sports team option; and
  - a keyword option.
5. The electronic programming guide of any preceding Claim, wherein the suggest module comprises a scoring algorithm for generating a score for the program according to the viewer profile and the program listing information.
6. The electronic programming guide of Claim 5, wherein the suggest module is further operable to associate a color with the program in the preferred schedule according to the score for the program.
7. The electronic programming guide of Claim 5 or Claim 6, wherein the suggest module is further operable to select a channel for viewing according to the score for the program.
8. The electronic programming guide of any preceding Claim, wherein the viewer profile comprises an option that corresponds to an undesirable program, the suggest module operable to prevent viewing of the undesirable program in accordance with the op-

tion and program listing information for the undesirable program.

9. A method performed on a computing platform that is associated with a television for providing functionality associated with an electronic programming guide, the method comprising:

storing a viewer profile in a profile database; accessing the viewer profile in the profile database and program listing information stored in a program listing database for a plurality of television programs; and generating a preferred schedule in accordance with the viewer profile and the program listing information, the preferred schedule indicative of the desirability of a particular program relative to other programs.

10. The method of Claim 9, further comprising the steps of:

receiving viewer preference information; and generating the viewer profile according to the viewer preference information.

11. The method of Claim 10, further comprising the step of providing a preference template to the viewer for receiving the viewer preference information.

12. The method of any of Claims 9 to 11, wherein the step of storing the viewer profile comprises storing a viewer profile having a ranking corresponding to an option selected from the group consisting of:

a genre option;  
an actor option;  
a sports team option; and  
a keyword option.

13. The method of any of Claims 9 to 12, further comprising the step of generating a score for the program according to the viewer profile and the program listing information.

14. The method of Claim 13, further comprising the step of associating a color with the program in the preferred schedule according to the score for the program.

15. The method of Claim 13 or Claim 14, further comprising the step of selecting a channel for viewing according to the score for the program.

16. The method of any of Claims 9 to 15, wherein the step of storing the viewer profile having storing a viewer profile comprises an option that corresponds to an undesirable program, and preventing viewing

of the undesirable program according to the option and program listing information for the undesirable program.

17. A method performed on a computing platform that is associated with a television and a recorder for recording a television program, the method comprising:

receiving viewer input information;  
accessing program listing information for a plurality of programs stored in a program listing database coupled to the platform;  
comparing the input information with the program listing information;  
generating recording information for the program in accordance with the comparison; and communicating recording information for the program to the recorder to instruct the recorder to record the program.

18. The method of Claim 17, wherein the step of receiving viewer input information comprises receiving viewer input information comprising a program title.

19. The method of Claim 17, wherein the step of receiving viewer input information comprising receiving viewer input information comprises viewer preference information that includes a ranking corresponding to an option selected from the group consisting of:

a genre option;  
an actor option;  
a sports team option; and  
a keyword option.

20. The method of Claim 19, further comprising the step of generating a score for the program according to the viewer preference information and the program listing information.

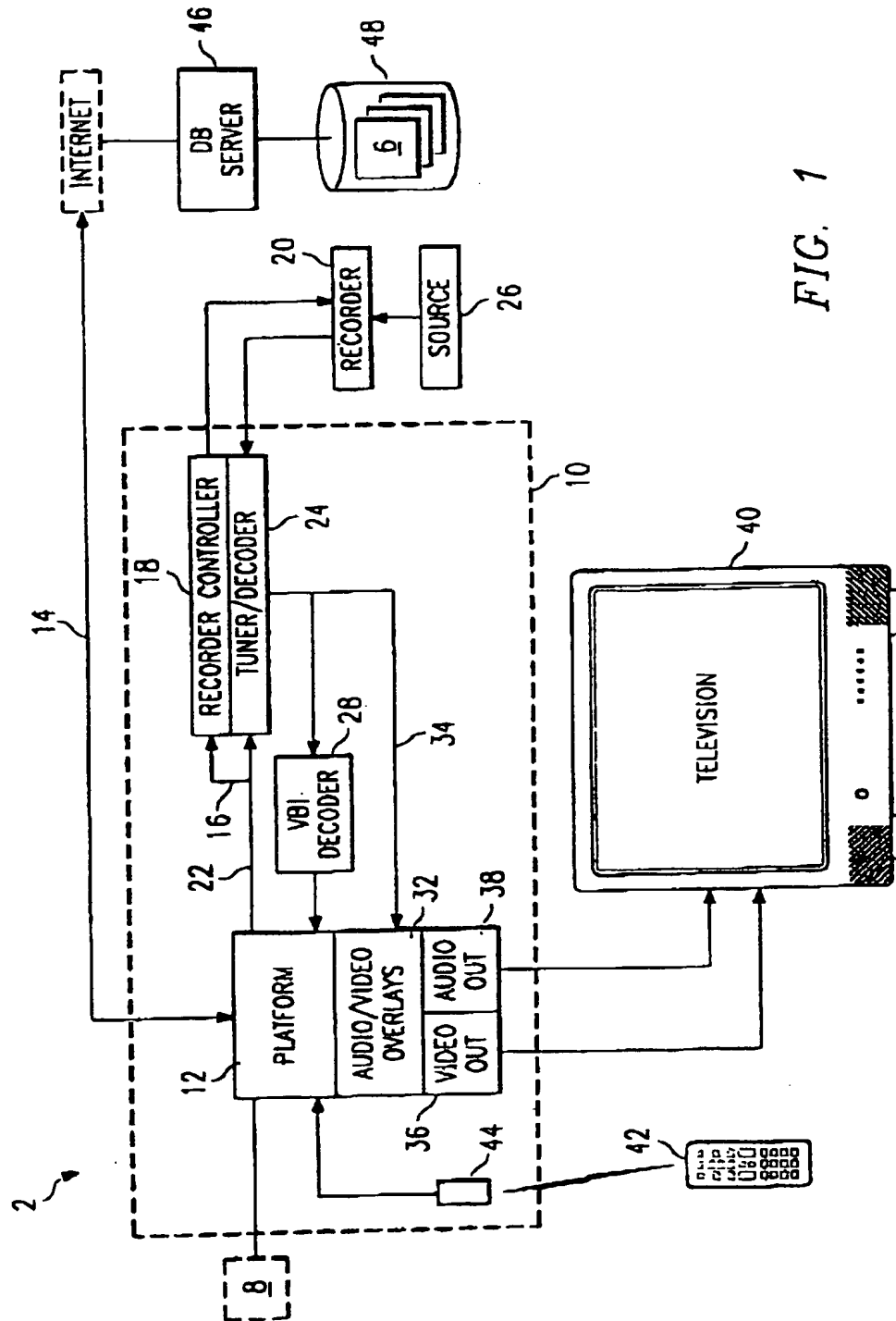


FIG. 1

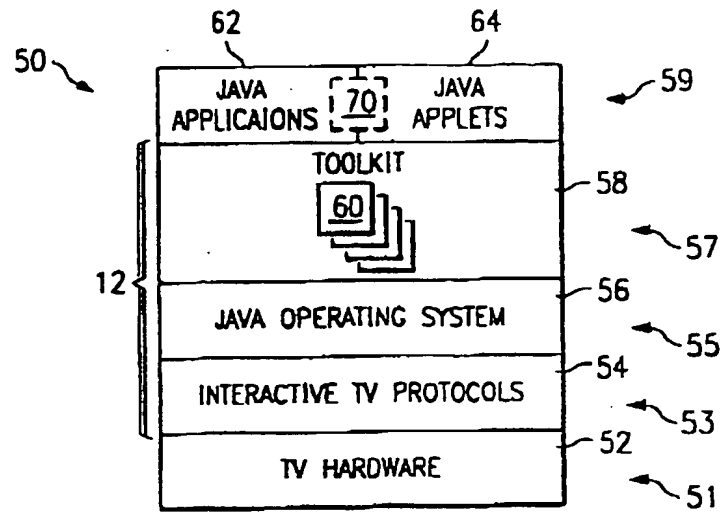


FIG. 2

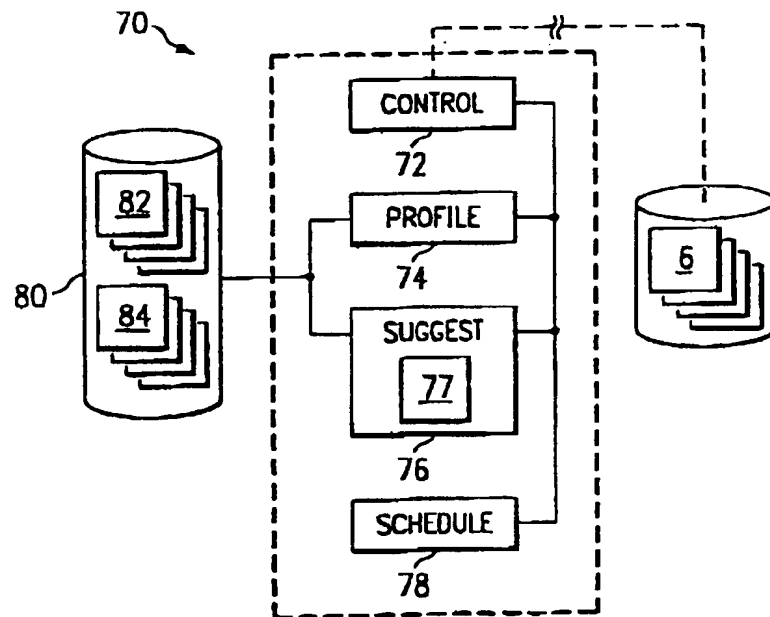


FIG. 3

82

90

GENRE PREFERENCES	
GENRE	(-) RANKING (+)
86 DRAMA	88 ○○○○○
86 HORROR	88 ⊙○○○○
86 COMEDY	88 ○○○○○
86 ROMANCE	88 ○○○○○
...	...

FIG. 4

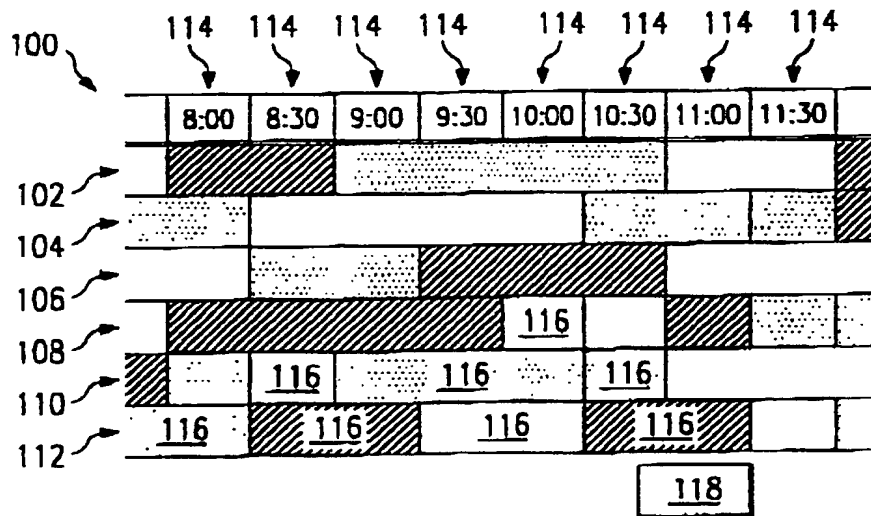


FIG. 5



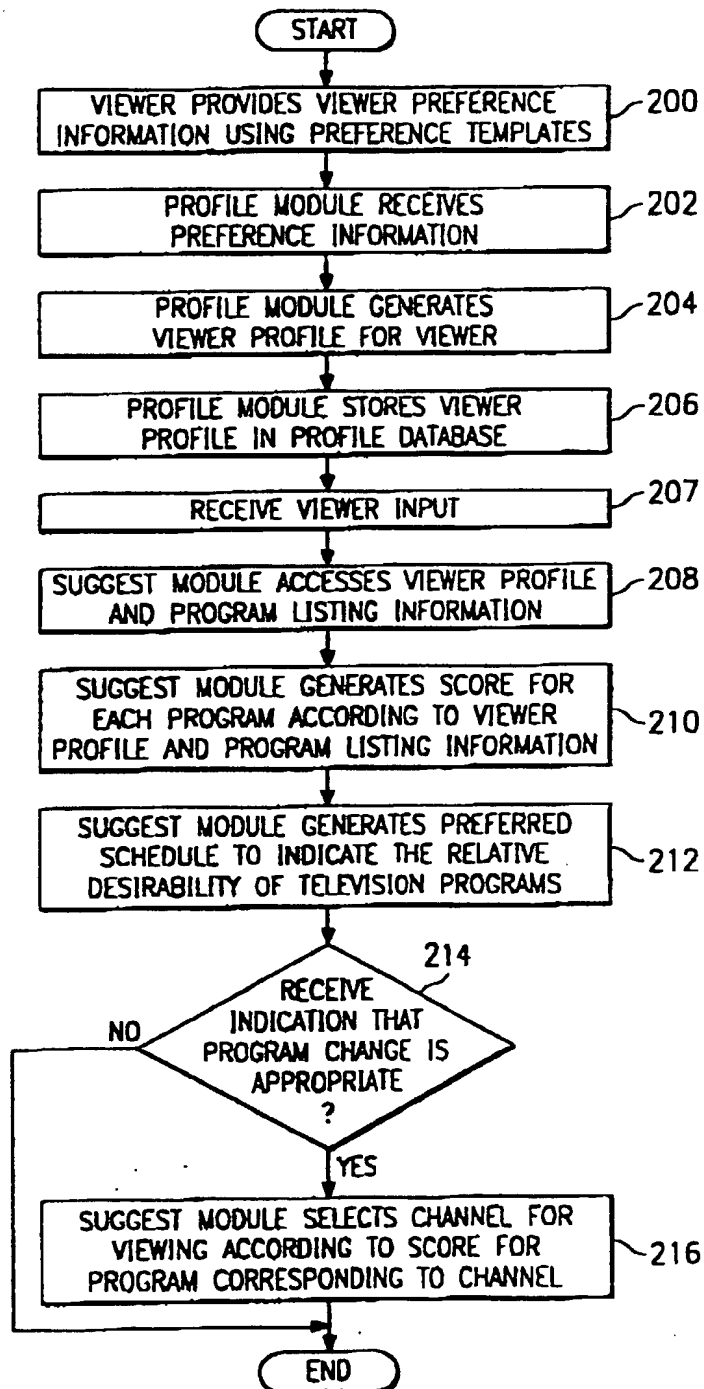


FIG. 6

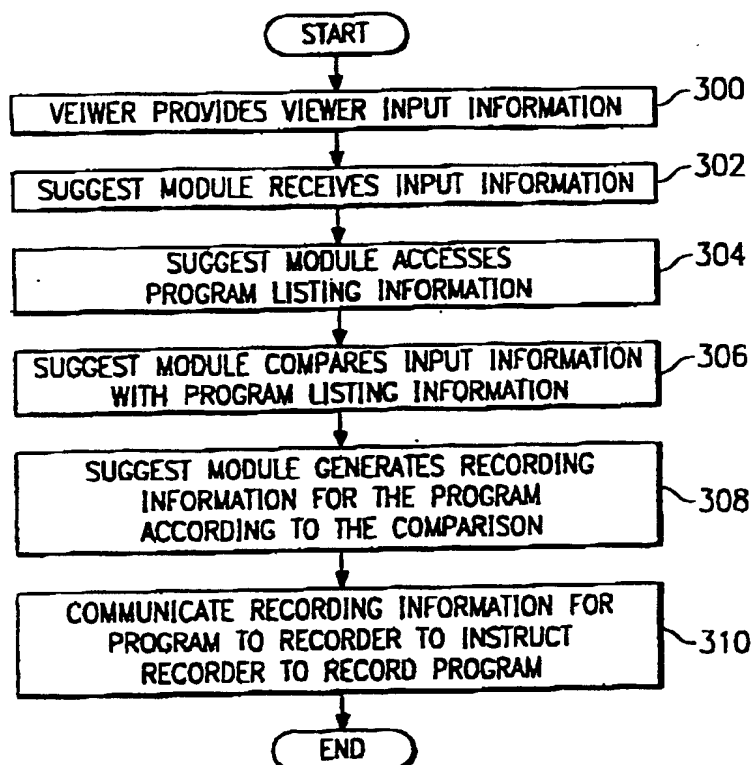
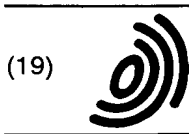


FIG. 7



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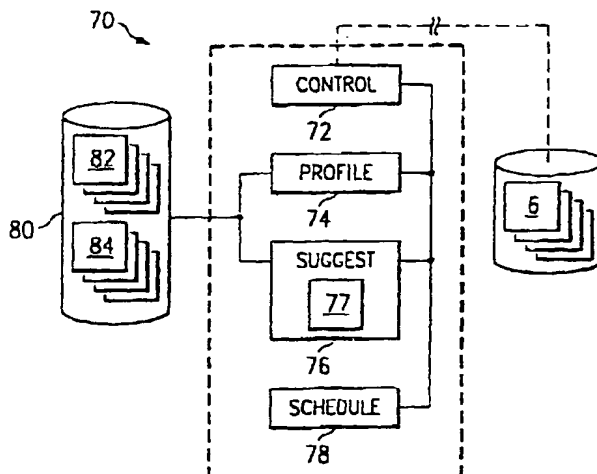
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(54) **Electronic television program guide system and method**

(57) An electronic programming guide (70) operates on a computing platform (12) associated with a television (40). The platform (12) accesses a program listing database (48) containing program listing information (6) for a plurality of television programs. The electronic programming guide (70) includes a profile database (80) that stores a viewer profile (84) and a suggest module (76) that is coupled to the profile database (80). The suggest module (76) accesses the viewer profile (84) and

the program listing information (6) and, in response, generates a preferred schedule (100) according to the viewer profile (84) and the program listing information (6). The preferred schedule (100) indicates the desirability of a particular program relative to other programs. The electronic programming guide (70) may also be used to instruct a recorder (20) to record a television program in accordance with the program listing information (6) and viewer input information that does not specify broadcast information concerning the program.



**FIG. 3**

**EP 0 854 645 A3**



European Patent  
Office

# EUROPEAN SEARCH REPORT

Application Number  
EP 98 30 0018

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
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Y	* page 47, line 8 - line 20 * * page 53, line 16 - line 24 * * page 59, line 10 - page 79, line 2 *	8,16-20	
Y	US 5 585 866 A (MILLER L. ET AL) 17 December 1996 * column 7, line 48 - column 12, line 31 * * column 16, line 61 - column 17, line 17 * * column 20, line 19 - column 24, line 43 * * column 25, line 16 - column 28, line 37 *	8,16	
Y	WO 94 13107 A (DISCOVERY COMMUNICATIONS INC.) 9 June 1994 * page 20, line 31 - page 21, line 1 * * page 83, line 14 - page 85, line 23 * * page 91, line 6 - line 24 *	17-20	
X	EP 0 682 452 A (MICROSOFT CORPORATION) 15 November 1995 * column 7, line 14 - column 8, line 49 * * column 15, line 33 - column 16, line 31 *	1,2, 9-11,17	TECHNICAL FIELDS SEARCHED (Int.Cl.6) H04N
X	"ELECTRONIC PROGRAM GUIDE VIA INTERNET" RESEARCH DISCLOSURE, no. 38502, 1 May 1996, page 276 XP000599701 * the whole document *	1,9,17	
A	WO 96 17467 A (HERZ F. ET AL) 6 June 1996 * page 7, line 10 - page 31, line 18 *	1,9,17	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 October 1998	Examiner Verschelden, J
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document		T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document	

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P,X	WO 97 33434 A (ACTV INC.) 12 September 1997 * page 6, line 22 - page 8, line 12 * * page 9, line 5 - page 18, line 24 *	1-3,9,17	
P,X	WO 97 41690 A (AWARD SOFTWARE INTERNATIONAL INC.) 6 November 1997 * the whole document *	1-3,9,17	
P,X	EP 0 777 385 A (INTERNATIONAL BUSINESS MACHINES) 4 June 1997 * page 6, line 8 - page 11, line 29 *	1-3,8,9, 17	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>30 October 1998</b>	Examiner <b>Verschelden, J</b>
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
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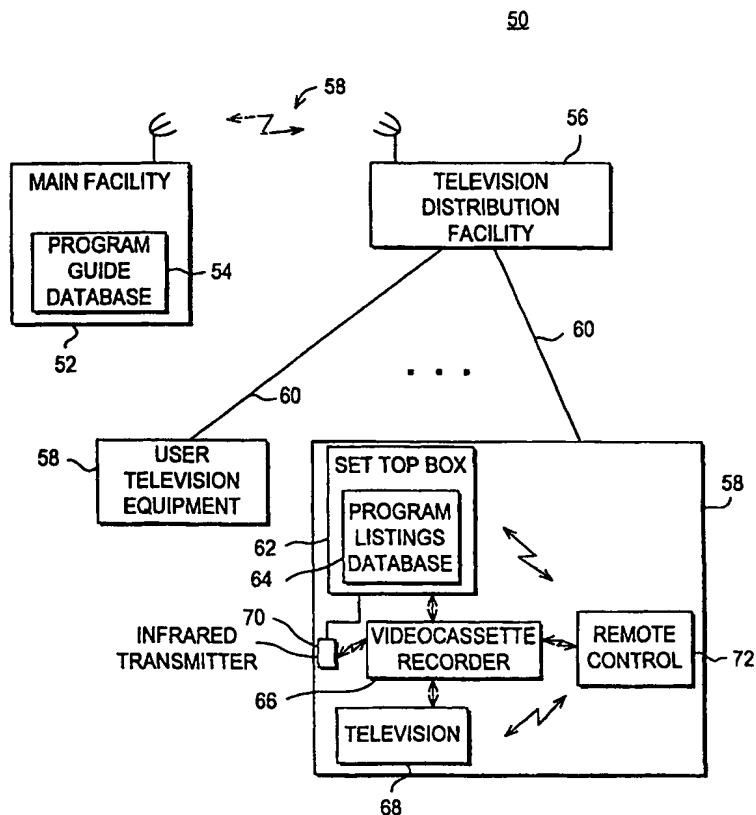
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US99/16040 (22) International Filing Date: 16 July 1999 (16.07.99) (30) Priority Data: 60/093,197 17 July 1998 (17.07.98) US 09/330,793 11 June 1999 (11.06.99) US (71) Applicant: UNITED VIDEO PROPERTIES, INC. [US/US]; 7140 South Lewis Avenue, Tulsa, OK 74136 (US). (72) Inventors: BOYER, Franklin, E.; 191 Lake Shore Drive, Cleveland, OK 74020 (US). DEMERS, Timothy, B.; 7724 South Hudson Avenue, Tulsa, OK 74136 (US). (74) Agents: TREYZ, G., Victor et al.; Fish & Neave, 1251 Avenue of the Americas, New York, NY 10020 (US).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  Published With international search report.

(54) Title: TELEVISION SYSTEM WITH AIDED USER PROGRAM SEARCHING

## (57) Abstract

A system having an adaptive browse feature and an adaptive flip feature is provided. The adaptive browse and flip features may be selected to receive program viewing suggestions. The system may provide a suggestion by displaying an adaptive browse region or adaptative flip region including a program suggestion. The system identifies programs to suggest based on a user's viewing activity. The system uses different algorithms that are user-selectable and user-adjustable to identify program suggestions. The system may query a program guide database to build a list of programs having attributes similar to the attributes of the current program or the last viewed program. The system may use an adaptive learning algorithm such as a neural network. The neural network may be trained by the program guide by monitoring user-viewing activity. Each algorithm may be personalized for multiple users.



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TELEVISION SYSTEM WITH AIDED  
USER PROGRAM SEARCHING

5 Background of the Invention

This invention relates to television systems, and more particularly, to television systems such as interactive television program guide systems having aided user program searching.

10 Cable, satellite, and broadcast television systems provide a large number of television channels. Typically, the number of channels provided by cable and satellite systems is over a hundred and ever increasing. Television viewers have traditionally  
15 consulted printed television program schedules to obtain programing information. More recently, interactive electronic television program guides have been developed to allow television program information to be displayed on viewer television equipment.

20 Interactive electronic television program guides ("program guides") typically provide program listings of all channels available in the television



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system. Some program guides include features for allowing users to scan through channel information or programs in order to select a program to access.

As detailed in Knee et al. U.S. Patent No. 5,589,892, a program guide may include browse and flip for user program searching. The browse feature presents a browse overlay region on the user's television screen that contains a program listing. The user may use up and down arrow keys take action from a user input interface device to direct the browse overlay to scan the listings on other channels while remaining tuned to the current channel. This allows the user to browse available program listings without missing any of the program on the current channel. The flip feature presents a flip overlay region on the user's television screen that contains a program listing. The user may flip through these listings. As the user changes channels, the program listing in the flip display region is updated to match the program on the current channel. With either the browse or flip feature, finding a suitable program for viewing may require scanning through individual program listings for numerous channels. Scanning through such a large number of channels to find a suitable program for viewing may be time-consuming and cumbersome.

It is therefore an object of the present invention to provide a television system that monitors a user's television viewing activity and suggests programs for the user to view.

Is it also an object of the present invention to provide a television system that displays suggested program listings and that allows the user to browse the

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suggested program listings using an adaptive browse feature.

It is also a further object of the present invention to provide a television system that displays suggested program listings and that allows the user to flip through the suggested listings using an adaptive flip feature.

#### Summary of the Invention

These and other objects of the invention are accomplished in accordance with the principles of the present invention by providing a system that monitors the television viewing of a user. The system determines the user's interests from the user's viewing activities and displays program listings for suggested programs. The user may browse through suggested program listings using an adaptive browse feature or may flip through suggested program listings using an adaptive flip feature.

The system maintains a database of program listings. The database may be maintained on each user's television equipment (e.g., on each user's set-top box), may be maintained on a central server (e.g., at the user's cable system headend) or other suitable platform. Each program listing has associated program attributes such as genre (comedy, movies, sports, etc.), rating (TV-G, PG, etc.), critic's rating (one star, two stars, etc.), actors, scheduled program length, and other related parameters that can be tagged to a program. The system may compare the attributes of the programming that is viewed by the user with the attributes associated with the program listings in the

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database to locate suitable matches. The program listings whose program attributes most closely match the attributes of the program listings are presented to the user as viewing suggestions. If desired, the  
5 system may take into account the length of time the user views programs or other such criteria. Programs that are viewed the most may be given relatively higher weights than programs that the user only partially viewed.

10 The system may recommend programming based on the program attributes of the current program being viewed, the last program that was viewed, programming in general that the user has recently viewed, or the program attributes of some other suitable set of  
15 programming. The user may be presented with an option to choose whether the system bases its recommendations on the current program, the last program, or programming generally. In addition, the user may adjust weighting factors and other settings that  
20 influence the algorithm used by the system to make program suggestions. A neural network algorithm may be used to make programming suggestions.

The user may browse through suggested program listings using an adaptive browse feature. The  
25 adaptive browse feature displays an adaptive browse region on the user's television screen as a current television program is being displayed. The adaptive browse region contains a suggested program listing. The user may take actions from a user input interface  
30 device to scan through suggested program listings for other channels without interrupting the current television program.

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The user may flip through suggested program listings using an adaptive flip feature. The adaptive flip feature displays an adaptive flip region on the user's television screen as the current television program is displayed. The adaptive flip region contains a suggested program listing. The user may scan through suggested program listings by taking actions from a user input interface device. Each time a user requests another suggestion, the system displays the next available suggested program listing, tunes the user's television equipment to that channel, and displays the program that is currently on that channel.

The system may be implemented by integrating the adaptive flip and adaptive browse features into an interactive television program guide. The adaptive flip and browse features may also be implemented as part of other applications or as part of a stand-alone application.

If the system supports both regular flip and browse features (in which all available programs listings are presented) and adaptive browse and flip features (in which only suggested program listings are presented), the user may be provided with an opportunity selectively enable the adaptive flip and browse features. The adaptive flip and browse features may be invoked using dedicated keys, certain combinations of keys, switches, menu options, or any other suitable technique. When the adaptive flip and browse features have been turned on, these features may be invoked in the same ways that regular flip and browse features are invoked.

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These and other objects of the invention are accomplished in accordance with the principles of the present invention by providing an interactive television program guide system having an interactive television program guide application

Further features of the invention, its nature and various advantages will be more apparent from the accompanying drawings and the following detailed description of the preferred embodiments.

#### 10 Brief Description of the Drawings

FIG. 1 is a diagram of an illustrative interactive television program guide system in accordance with the present invention.

FIG. 2 is a simplified plan view of an illustrative remote control in accordance with the present invention.

FIG. 3 is a diagram illustrating an adaptive browse display region on a television screen, an adaptive browse display region on a television screen that may be provided when a navigational key of a remote control is pressed, and a television screen that may be provided when a program listing is selected in accordance with the present invention.

FIG. 4 is a diagram illustrating an adaptive browse display region on a television screen, an adaptive browse display region on a television screen that may be provided when a navigation key of a remote control is pressed, and an adaptive browse display region on a television screen that may be provided when a program listing is selected in accordance with the present invention.

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FIG. 5 is a flow chart of illustrative steps involved in providing an embodiment of an adaptive browse feature in accordance with the present invention.

5           FIG. 6 is a diagram illustrating an adaptive browse display region on a television screen, an adaptive browse display screen on a television screen that may be provided when a "right" navigation key of a remote control is pressed, and an adaptive browse  
10 display region on a television screen that may be provided when a "down" navigation key of a remote control is pressed in accordance with the present invention.

FIG. 7 is a flow chart of illustrative steps  
15 involved in providing an adaptive browse display region in response to user selection of a remote control navigation key in accordance with the present invention.

FIG. 8 is a diagram illustrating an adaptive  
20 browse display region and an on-screen adaptive browse confirmation on a television screen that may be provided after a user presses a sequence of remote control keys in accordance with the present invention.

FIG. 9 is a diagram illustrating a browse  
25 display region and an on-screen adaptive browse confirmation on a television screen that may be provided after a user presses a sequence of remote control keys in accordance with the present invention.

FIG. 10 is a diagram illustrating an adaptive  
30 browse display screen having an adaptive browse display region and a compressed video display region in accordance with the present invention.

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FIG. 11 is a diagram illustrating a navigator display screen, a browse setup display screen that may be provided when a user selects browse setup, and a television screen that may be provided when a browse  
5 setup display screen is exited in accordance with the present invention.

FIG. 12 is a flow chart of illustrative steps involved in providing an on-screen confirmation of adaptive browse mode in accordance with the present  
10 invention.

FIG. 13 is a flow chart of illustrative steps involved in providing an adaptive browse display region based on attributes of the currently displayed program in accordance with the present invention.

15 FIG. 14 is a flow chart of illustrative steps involved in providing an adaptive browse display region based on attributes of the last displayed program in accordance with the present invention.

FIG. 15 is a flow chart of illustrative steps  
20 involved in providing a list of programs for an adaptive browse display region based on attributes of user-viewed programs in accordance with the present invention.

FIG. 16a is a flow chart of illustrative  
25 steps involved in providing a list of programs based on the currently displayed program in accordance with the present invention.

FIG. 16b is a flow chart of illustrative  
steps involved in providing a list of programs based on  
30 a previously displayed program in accordance with the present invention.

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FIG. 16c is a flow chart of illustrative steps involved in providing a list of programs based on television viewing habits in accordance with the present invention.

5           FIG. 17 is a diagram of an illustrative navigator display screen, a setup display screen that may be provided when "setup" is selected, and an adaptive browse criteria settings display screen in accordance with the present invention.

10           FIG. 18 is a flow chart of illustrative steps involved in providing a list of programs using an adaptive learning algorithm in accordance with the present invention.

15           FIG. 19 is a flow chart of illustrative steps involved in providing a trained neural network in accordance with the present invention.

20           FIG. 20 is a diagram of an illustrative navigator display screen, a setup display screen that may be provided when "setup" is selected, and an adaptive browse criteria settings display screen in accordance with the present invention.

25           FIG. 21 is a diagram of an illustrative adaptive browse criteria settings display screen that may include a user-selectable adjust trained neural network portion, an adaptive browse criteria settings display screen that may be provided when the adjust trained neural network option is selected, and an adaptive browse criteria settings display screen that may be provided when an add/select option is selected  
30 in accordance with the present invention.

FIG. 22 is a diagram illustrating an adaptive flip display region on a television screen, a



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corresponding adaptive flip display region on a television screen that may be provided when a channel-up key of a remote control is pressed, and an adaptive flip display screen that may be provided when the channel-up key of the remote control is pressed again in accordance with the present invention.

FIG. 23 is a diagram illustrating an adaptive flip display screen having an adaptive flip display region with a compressed video display region, an adaptive flip display screen having an adaptive flip display region and a compressed video display region that may be provided when an a channel-up key of the remote control is pressed, and a television screen that may be provided when a program is selected for viewing in accordance with the present invention.

FIG. 24 is a flow chart of illustrative steps involved in providing an adaptive flip feature in accordance with the present invention.

FIG. 25 is a diagram illustrating a navigator display screen, a flip setup display screen that may be provided when flip setup is selected, and a television screen that may be displayed after the flip setup display screen is exited in accordance with the present invention.

FIG. 26 is flow chart of illustrative steps involved in providing an on-screen confirmation of adaptive flip mode in accordance with the present invention.

FIG. 27 is a diagram of an illustrative navigator display screen, a setup display screen that may be provided when "setup" is selected, and an

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adaptive flip criteria settings display screen in accordance with the present invention.

FIG. 28 is a diagram illustrating a navigator display screen, a setup display screen that may be provided when "setup" is selected, and an adaptive flip criteria settings display screen in accordance with the present invention.

FIG. 29 is a diagram illustrating an adaptive flip criteria settings display screen that may include a user-selectable adjust trained neural network option, an adaptive flip criteria settings display screen that may be provided when the adjust trained neural network option is selected, and an adaptive flip criteria settings display screen that may be provided when an add/select option is selected in accordance with the present invention.

FIG. 30 is a diagram illustrating a grid display screen that is displayed when an "other shows" option is selected, a pop-up display region that is displayed when a list option is selected, and a grid display region.

#### Detailed Description of the Preferred Embodiments

An illustrative interactive television program guide system 50 in accordance with the present invention is shown in FIG. 1. Main facility 52 includes a program guide database 54 for storing program guide information (e.g., television program listings data, program-related information, service listings data, service-related information, pay-per-view ordering information, television program promotional information, etc.).

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Main facility 52 preferably includes a processor to handle information distribution tasks. Information from database 54 may be transmitted in parallel via communication links such as communication link 58 to multiple television distribution facilities such as television distribution facility 56. Only one television distribution facility is shown in FIG. 2 to avoid over complicating the drawings. Each communication link 58 may be a satellite link, a telephone network link, a combination of such links, or another suitable communication path. Text, graphics, and video data signals may be transmitted over link 58. If it is desired to transmit video signals over communication link 58, a relatively high bandwidth link such as a satellite link is generally preferable to a relatively low bandwidth link such as a telephone line.

Television distribution facility 56 is a facility such as a cable system headend, a broadcast distribution facility, or a satellite television distribution facility for distributing television signals to viewers.

The program guide information transmitted by main facility 52 to television distribution facility 56 includes television program listings data such as program times, channels, titles, descriptions, etc. Transmitted program guide information may include pay program data such as pricing information for individual programs and subscription channels, time windows for ordering programs and channels, telephone numbers for placing orders that cannot be impulse ordered, etc.

Television distribution facility 56 may distribute program guide information received from main

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facility 52 to user television equipment 58 via communication paths 60. User television equipment 58 may be any suitable equipment for providing television that contains sufficient processing capabilities to  
5 monitor viewing activities, analyze these activities and display appropriate program listings information for the user.

Communication paths 60 may be cable links, fiber optic links, satellite links, broadcast links, or  
10 other suitable link, or a combination of such links. Any suitable communications scheme may be used to transmit data over paths 60, including in-band transmissions, out-of-band transmissions, digital transmissions, analog transmissions, cable  
15 transmissions, satellite transmissions, over-the-air transmissions, multichannel multipoint distribution services (MMDS) transmissions, etc.

Communication paths 60 preferably have sufficient bandwidth to allow television distribution  
20 facility 56 to distribute television programming, program listings information, advertisements, and other information to user television equipment 58. Multiple television and audio channels (analog, digital, or both analog and digital) may be provided to user television  
25 equipment 58 via communication paths 60. If desired, some of the data may be distributed to user television equipment 58 by one or more distribution facilities that are separate from television distribution facility 56 using communication paths that are at least partly  
30 separate from communication paths 60.

The data distribution technique that is used to distribute data on paths 60 may depend on the type

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of information that is being distributed. For example, text and graphics may be distributed over an out-of-band channel using an out-of-band modulator or distributed in the vertical blanking interval lines of an analog video channel. Video information may also be distributed in this way, although large quantities of video information may be more efficiently distributed using one or more digital channels or streams on paths 60. Such digital channels or streams may also be used for distributing text and graphics.

Each user television equipment device 58 has a receiver which is typically a set-top box such as set-top box 62. The receiver may also be other suitable television equipment such as an advanced television receiver into which circuitry similar to set-top-box circuitry has been integrated or a personal computer television (PC/TV). For illustrative purposes, the present invention will be described in the context of user television equipment 58 that uses set-top boxes.

Each set-top box 62 preferably contains a processor to handle tasks associated with implementing an application on the set-top box 62 that assists the user in searching for programs related to the programs the user is watching. For example, a stand-alone application may be provided that supports adaptive browse and adaptive flip modes, as described more fully below. If desired, these tasks may be implemented using a program guide application. For clarity, the present invention will be described primarily in the context of such a program guide application and in the context of a program guide system. However, many

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aspects of the invention may be practiced in other types of systems or with other types of applications if desired.

Each set-top box 62 is typically connected to an optional videocassette recorder 66 so that selected television programs may be recorded. Videocassette recorder 66 is typically connected to a television 68. To record a program, set-top box 62 tunes to a particular channel and sends control signals to videocassette recorder 66 (e.g., using infrared transmitter 70) that instructs video cassette recorder 66 to start and stop recording at the appropriate times.

Television program listings, advertisements, programming information, and other information may be displayed on television 68. Set-top box 62, videocassette recorder 66, and television 68 may be controlled using one or more remote controls or may be controlled using any other suitable user input interface device such as a wireless keyboard, mouse, trackball, dedicated set of keys, etc.

Certain program guide features, such as pay program purchasing, the purchasing of products or services, and data collection functions, may require that user television equipment 58 transmit data to television distribution facility 56 over communications paths 60. If desired, such data may be transmitted over telephone lines or other separate communications paths. If features such as these are provided using facilities separate from television distribution facility 56, some of the communications involving user

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television equipment 58 may be made directly with the separate facility (not shown).

If desired, an interactive television program guide may be implemented using a data-relay architecture. In such an architecture, television distribution facility 56 may serve as a data relay site and user television equipment 58 may be a data destination site. For example, as television distribution facility 56 receives information from main facility 52, television distribution facility 56 may continuously or periodically distribute information to user television equipment 58. In a data-relay architecture, a program guide implemented on user television equipment 58 may use a database (e.g., database 64) for storing program guide information at user television equipment. Program guide information may include program listings and program attributes. Program attributes may be information such as program title, program actors, program duration, program genre (e.g., sports, comedy, movies, etc.), program channel, scheduled program duration, program rating (e.g., TV-G, PG-13, etc.), program content rating (or critics' rating or star rating, e.g., 1 star, two stars, etc.) and other related parameters that can be tagged to a program. Television distribution facility 56 may also poll set-top boxes periodically for certain information (e.g., pay program account information or information regarding programs that have been purchased and viewed using locally-generated authorization techniques).

The features of the present invention may be implemented in a client-server arrangement or in a combination client-server and data-relay arrangement.

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For clarity, the present invention is sometimes described primarily in the context of program guides that are implemented on user television equipment rather than in the context of program guides that are implemented partially on a server and partially on user television equipment or a more fully server-based architecture.

For illustrative purposes, the present invention is discussed in the context of using a remote control for the user input interface device. An illustrative remote control 80 is shown in FIG. 2. Remote control 80 may include up-navigation key 82, down-navigation key 84, right-navigation key 86, left-navigation key 88, OK key 90 (also sometimes called an enter or select key -- for clarity all of which are referred to as an OK key), channel-up key 92, channel-down key 94, switch 96, adaptive browse function key 98, adaptive flip function key 100, numeric key pad 102, and dedicated function keys 104a, 104b, and 104c. Navigation keys 82, 84, 86, and 88 may also be known as arrow keys. Other remote control keys may include an information "INFO" key, a record key, a volume control key, etc.

A highlight window in a program guide display screen may be moved in a desired direction using navigation keys 82, 84, 86, and 88. Data entry may be accomplished using OK key 90. Channel tuning control may be accomplished using channel-up and channel-down keys 92 and 94. Switch 96 may have plural positions for providing predetermined program guide modes or settings. Numeric key pad 102 may include number keys (not shown) for entry of numbers when necessary.



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Adaptive browse function key 98 and adaptive flip function key 100 may provide dedicated control of adaptive browse and adaptive flip modes respectively. Access to the adaptive flip and adaptive browse modes may be accomplished using keys other than adaptive browse function key 98 and adaptive flip function key 100. Dedicated button keys 104a, 104b, and 104c may have dedicated functionality for reducing the number of keys necessary for accessing program guide features.

10 Use and operation of remote control keys are further discussed below in relation to program guide display screen and program guide control.

As shown in FIG. 3, the program guide of the present invention may display illustrative adaptive browse display region 110 on illustrative television display screen 112, illustrative adaptive browse display region 114 on illustrative television display screen 116, and illustrative television screen 118. Television screen 112 may include video for a program, Star Trek Deep Space Nine, airing on a currently-tuned channel. When a user presses an adaptive browse function key on a remote control 80, adaptive browse display region 110 may be displayed on television screen 112. Adaptive browse display region 110 may provide program listing information while television screen 112 continues to include video of the program airing on the currently tuned channel, Star Trek Deep Space Nine.

Adaptive browse display region 110 may be displayed when a user presses an adaptive browse function key on remote control 80. Adaptive browse display region 110 may include time portion 120,

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channel identification portion 122, program information portion 124, time window portion 126, up-direction portion 128, down-direction portion 130, right-direction portion 132, and option 133 for selecting to  
5 use the current program in determining programs for adaptive browse.

Time window portion 126 may include information identifying a program listing time window. Time window portion 126 may also include on-screen  
10 confirmation of browse or adaptive browse mode. Channel identification portion 122 may include an identification of a channel. Initially, channel identification portion 122 may include an identification of the currently tuned channel. Program  
15 information portion 124 may include information on a program airing on the channel identified in channel identification portion 122 in the time window identified in time window portion 126.

Initially, program information portion 124  
20 may include information on the current program being watched when adaptive browse display region 110 is invoked, Star Trek Deep Space Nine on channel 9. Time portion 120 may include an indication of the current time. Right-direction portion 132 may include a right  
25 direction arrow indicating that information on a future time window is available. Up-direction portion 128 and down-direction portion 130 may include direction arrows indicating up and down channel browse availability. During the display of adaptive browse display region  
30 110, the system may monitor the viewing activity of the user to determine one or more program attributes of the programming viewed by the user. For example, if the

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user has viewed the current program for a predetermined minimum period or, if the user has selected option 133 which indicates that the attributes of the current program are to be used, the system may determine the genre program attribute for the current program. The system then locates program listings for current programs that match that genre and displays those program listings in an adaptive flip or an adaptive browse display. Flip-type displays are displays that contain individual program listings. Flip displays are activated whenever the user changes channels with the channel up or down keys. The program listing in the flip display is always in sync with the current channel. Browse-type displays contain program listings that are not always in sync with the current channel. Rather, the user may use arrow keys to browse listings for programs on other channels. The up and down arrow keys may change the channel for the suggested program listing for browse-type displays and not change the channel for the television program being displayed on the user's television screen. The user may browse future suggested program listings by pressing a right arrow key.

Adaptive browse display screen 114 may be displayed on television screen 116 when a user selects an up-navigation key 82 on a remote control 80 from adaptive browse display region 110. As in television screen 112, television screen 116 includes video of the program airing on the currently tuned channel, Star Trek Deep Space Nine on channel 9. Adaptive browse display screen 114 may include program information portion 134 that contains a viewing suggestion for a

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current program on a different channel. For example, program information portion 134 may include information on a program, Babylon 5, that is currently being shown on channel 112 and that is related by genre (science fiction) to the current television program (Star Trek Deep Space Nine). Program information portion 134 may include the scheduled time and duration of the program. Channel identification portion 136 of adaptive browse display region 114 may include an identification of the channel, WKAX channel 112, associated with the program, Babylon 5, suggested in program information portion 134. Each time the user presses up-navigation key 82 (FIG. 2), the system locates the next channel that has programming of the same type as that being viewed by the user. The adaptive browse feature skips over channels whose programming is not related to the programming to the programming on the current channel.

When the user selects an OK key while adaptive browse display region 114 is being displayed, the channel identified in channel identification portion 136, WKAX channel 112, may be tuned to and television screen 118 may be displayed. Television screen 118 may include video of the program, Babylon 5, airing on the channel that was tuned to and the program may be identified in program information region 134.

As shown in FIG. 4, the adaptive browse function may be used to assist the viewer in selecting future programming. The system may display illustrative adaptive browse display region 136 on illustrative television screen 138, illustrative adaptive browse display region 140 on illustrative television screen 142, and illustrative adaptive browse

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display region 144 on illustrative television screen 146. Television screen 138 may include video of a program, Star Trek Deep Space Nine that is airing on the channel to which user television equipment 58 is currently tuned channel, KTVJ channel 10. Adaptive browse mode may be invoked using any suitable technique. For example, adaptive browse mode may be invoked when a user presses and holds a navigation key on remote control 80 for a predetermined time period.

10 Adaptive browse display region 136 may be displayed on television screen 138. Adaptive browse display region 136 may provide program listing information while television screen 138 continues to include video of the program, Star Trek Deep Space Nine, that is airing on the channel to which user television equipment 58 is currently tuned (KTVJ channel 10).

Adaptive browse display region 136 may include program information portion 150, time portion 148, channel identification portion 152, time window portion 154, up-direction portion 156, down-direction portion 158, and right-direction portion 160. Time portion 148 may indicate the current time to be 8:45 PM. Initially, the scheduled time of the current program, 8:00 PM to 9:00 PM, may be included in the program information portion 150.

When a right-navigation key of a remote control is selected from adaptive browse display region 136, adaptive browse display screen 140 may be displayed on television screen 142. Adaptive browse display screen 140 may include the same display portions as adaptive browse display region 136. Adaptive browse display region 140 may also include a

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left-direction portion 169. Left-direction portion 169 may include a left direction arrow indicating that information for an earlier time window is available. As in television screen 138, television screen 142 includes video of the program airing on the channel to which the system is currently tuned, Star Trek Deep Space Nine on channel 10. Time window portion 162 of adaptive browse display region 140 may include information identifying a future time window. For example, time window portion 162 may identify a 9:00 PM time window. Program information portion 166 of adaptive browse display screen 140 may include information on a program, NYPD Blue. The program, NYPD Blue, may be a program suggested for viewing based on characteristics of user-viewing activity that the system determined when the viewer was watching Star Trek Deep Space Nine. Program information portion 166 may include the scheduled time and duration of the suggested program (e.g., 9:00 PM to 10:00 PM in the example of FIG. 4). Channel identification portion 167 of adaptive browse display region 140 may include an identification of the channel, KCNC channel 27, associated with the suggested program, NYPD Blue.

Selecting an OK key may indicate that a user is interested in accessing the upcoming program identified in program information portion 166. When a user selects an OK key from adaptive browse display region 140, adaptive browse display region 144 may be displayed on television screen 146. Adaptive browse display region 144 may include set-reminder option 168, record option 170, and order option 165 that are user-selectable. Set-reminder option 168 may provide an

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opportunity to set a reminder to view the program identified in program information region 166. Record option 170 may provide an opportunity to automatically record the program identified in program information  
5 region 166. Order option 165 may provide an opportunity to order the upcoming program (e.g., pay per view program).

Illustrative steps involved in providing an adaptive browse feature such as the adaptive browse  
10 feature of FIG. 3 and FIG. 4 are shown in FIG. 5. Initially, the user adjusts any adjustable adaptive browse settings and begins to watch television. At step 172, the program guide monitors the viewing and program guide activity of the user. Step 172 may  
15 involve determining which programs the user is watching (substep 172a), determining when and for how long the user is watching certain programs (substep 172b), determining the program attributes of the programs being viewed (step 172c), and determining if the user  
20 has selected the current program to be used in building a list of programs (step 172d). The program attribute for the programs being viewed are stored in a database such as program listings database 64 of FIG. 1. When the user invokes the adaptive browse feature, the  
25 system builds a list of programs from a program listings database such as program listings database 64 of FIG. 1 whose program attributes match (or are otherwise similar to) the program attributes of programming viewed by the user. The programming viewed  
30 by the user may be the current program being viewed the last program viewed for a substantial length of time, or may be general programming that the user has viewed.

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The list may be built when the adaptive browse feature is first activated concurrently with step 172, or at any other suitable time. At step 174, the program guide may display an adaptive browse display region.

- 5 The adaptive browse region may include a program listing for one of the programs on the list that was built at step 172. The program listings may be for either a current program or a future program. The program listing may be selected by a user. When a user  
10 selects a program listing for a current program, the program guide may tune to the channel airing the current program at step 176. When a user selects a program listing for a future program, the program guide may display one or more user-selectable options related  
15 to the future program at step 178.

Another way in which the user may invoke and use the adaptive browse feature is by pressing a dedicated adaptive browse function key whenever the user presses a navigation cursor key. This is shown in  
20 FIG. 6. As shown in FIG. 6, the program guide of the present invention may display illustrative adaptive browse display region 180 on illustrative television screen 182, illustrative adaptive browse display region 184 on illustrative television screen 186, and  
25 illustrative adaptive browse display region 188 on illustrative television screen 190. Television screen 182 may include video of a program airing on a channel currently tuned to and being watched when adaptive browse display region 180 is invoked. Television  
30 screen 182 may include video of a program, Star Trek Deep Space Nine, airing on a currently tuned channel, KTVJ channel 10. When a user presses an adaptive



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browse function key and a navigation key of a remote control, adaptive browse display region 180 may be displayed on television screen 182. Adaptive browse display region 180 may include a program listing  
5 portion 192 for Star Trek Deep Space Nine. Program listing portion 192 may include a program information portion and a program channel identification portion. Adaptive browse display region 180 may also include current time portion 194 and time window portion 196.  
10 Time window portion 196 identifies the program listing time window of interest (e.g., the 8:00 PM time window). Current time portion 194 may indicate the current time (e.g., 8:45 PM).

When a user selects an adaptive browse  
15 function key and a right-navigation key from adaptive browse display region 180, adaptive browse display screen 184 may be displayed on television screen 186. As in television screen 182, television screen 186 may include video of the program airing on the currently  
20 tuned channel, Star Trek Deep Space Nine on channel 10. Adaptive browse display region 184 may include time window portion 198 identifying the program listing time of window of interest to be the 9:00 PM time window. Adaptive browse display region 184 may include program  
25 listing portion 200. Program listing portion 200 may identify a program, the movie Unforgiven starring Clint Eastwood on WKIK channel 22, as a viewing suggestion for the 9:00 PM time window based on the fact that the user was watching Star Trek Deep Space Nine (both  
30 programs involve action/adventure).

Adaptive browse display screen 188 may be displayed on television screen 190 when a user selects

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an adaptive browse function key and a down-navigation key from adaptive browse display region 184. As in television screens 182 and 186, television screen 190 may include video of the program airing on the currently tuned channel, Star Trek Deep Space Nine on channel 10. Adaptive browse display region 188 may include time window portion 199 identifying the program listing time window of interest to be the 9:00 PM time window. Adaptive browse display region 188 may include program listing portion 202. Program listing portion 202 may identify another program, Pale Rider on WOX channel 8, as another viewing suggestion for the 9:00 PM time window based on the fact that Pale Rider and Star Trek Deep Space Nine are both programs that involve action/adventure. From adaptive browse display region 188, an OK key may be selected to access user-selectable options such as record and set-reminder options related to Pale Rider on WOX channel 8 at 9:00 PM.

Thus, in addition to illustrating how a user may invoke and use the adaptive browse feature with a different set of remote control keys, the example of FIG. 6 shows how the user may view suggested program listings for various future programs (based on the programming viewed by the user) by using the right arrow key to move to a future time slot and subsequently using the up/down arrow keys to browse the listings in that slot that are related to the programming viewed by the user (e.g., the current program, the last program viewed, or various programs recently viewed by the user).

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Illustrative steps involved in providing an adaptive browse feature such as the adaptive browse feature of FIG. 6 are shown in FIG. 7. At step 204, an adaptive browse display region may be displayed in response to user actions. Initially, program listing information for the program airing on the currently tuned channel may be included in the adaptive browse display region. At step 208, When a user presses an up or down navigation key alone or in combination with other keys such as an adaptive browse function key (FIG. 6), an adaptive browse display region for a currently scheduled program on another channel may be displayed. At step 206, when a user presses a right-navigation key alone or in combination with other keys such as an adaptive browse function key (FIG. 6), an adaptive browse display region for a future-scheduled program may be displayed. At step 210, when a user presses a left-navigation key alone or in combination with other keys such as an adaptive browse function key (FIG. 6), an adaptive browse display region for an earlier scheduled program may be displayed. A program listing for a currently scheduled program, for an earlier-scheduled program, or for a future-scheduled program may be determined for an adaptive browse display screen based on characteristics of user-viewing activity. Additional adaptive display regions for currently scheduled, earlier-scheduled, or future-scheduled programs may be displayed in response additional remote control key strokes.

If desired, the adaptive browse feature may be invoked using a remote control switch 96 of FIG. 2. As shown in FIG. 8, the program guide of the present

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invention may display illustrative adaptive browse display region 212 on illustrative television screen 214. Adaptive browse display region 212 may be invoked when a user sets a remote control switch and presses a navigation key. Television screen 214 may include video of Star Trek Deep Space Nine which commenced airing on the currently tuned channel, KDND channel 9, at 8:00 PM and was being watched when adaptive browse display region 212 was invoked. Television screen 214 may include an on-screen adaptive browse confirmation portion 216. On-screen adaptive browse confirmation portion 216 may indicate that the adaptive browse feature has been enabled. On-screen adaptive browse confirmation portion 216 may be in the form of text (e.g., ADAPTIVE BROWSE ON). An on-screen adaptive browse confirmation indicator may be provided whenever desired, regardless of which technique is used to invoke or enable the adaptive browse feature.

As shown in FIG. 9, the adaptive browse feature may be invoked when the user presses an adaptive browse function key (such as adaptive browse function key 98 of FIG. 2) and a navigation key (such as one of navigation keys 82, 84, 86, and 88 of FIG. 2). the program guide of the present invention may display illustrative adaptive browse display region 218 on illustrative television screen 220. Adaptive browse display region 218 may be invoked when a user presses an adaptive browse function key and a navigational key on a remote control. Television screen 220 may include video of Star Trek Deep Space Nine which commenced airing on the currently tuned channel, KDND channel 9, at 8:00 PM and was being watched when adaptive browse

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display region 218 was invoked. Television screen 214 may include an on-screen adaptive browse confirmation portion 222. On-screen adaptive browse confirmation portion 216 may be in the form of an icon. The icon  
5 may be a translucent figure.

As shown in FIG. 10, the program guide of the present invention may display illustrative television screen 228 having an illustrative L-shaped adaptive browse display region 224 and an illustrative reduced-  
10 size video display region 226. Adaptive browse display region 224 may be invoked when a user presses a remote control navigation key or other suitable technique. Video of Star Trek Deep Space Nine, which has commenced  
15 airing on the currently tuned channel, may be reduced in size and included in video display region 226 when adaptive browse display region 224 is invoked. Adaptive browse display region 224 may include an on-screen adaptive browse confirmation portion 230. Adaptive browse display region 224 is large enough that  
20 it typically has room for more information or options than adaptive browse display region 218 of FIG. 9. Adaptive browse display region 224 may include program description portion 232, options portion 234, time window portion 236, channel identification portion 238,  
25 current time portion 240, up-direction portion 242, down-direction portion 244, and right-direction portion 246.

As shown in FIG. 11, the program guide of the present invention may display a menu (illustrative  
30 navigator display screen 248), a setup screen (illustrative browse setup display screen 250), and illustrative television screen 252. Navigator display

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screen may include browse setup option 254. Browse setup option 254 may be selected by positioning highlight window 256 on browse setup option 254 and pressing a data entry key (e.g. an OK key on a remote control). Browse setup display screen 250 may be displayed when a user selects browse setup option 254. Browse setup display screen 250 may include adaptive browse option 258 and may include "on" and "off" portions 260 and 262 associated with adaptive browse option 258. Positioning highlight window 264 on "on" portion 260 allows the user to adjust this setting so that the program guide browse feature is placed in adaptive mode (i.e., adaptive browse mode is enable). Selecting "off" portion 262 disables adaptive browsing and enables only standard browsing (in which program listings for all channels may be browsed, not just those related to the user's viewing activity). After enabling adaptive browse mode, a user may exit the browse setup display screen 250 to access television screen 252.

An adaptive browse confirmation may be displayed continuously whenever the adaptive browse feature has been enable (as opposed to a conventional browse feature) or only when adaptive browse mode is invoked (i.e., during adaptive browsing). Illustrative steps involved in providing an on-screen confirmation that the adaptive browse feature has been enabled such as on-screen adaptive browse confirmation portion 216 of FIG. 8 are shown in FIG. 12. At step 266, adaptive browse mode may be enabled by pressing a set of keys, turning on a switch, selecting an option from a browse setup display screen, activating a set-top box,

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pressing a dedicated set-top box button, etc. At step 268, on-screen confirmation that adaptive browse mode is on may be displayed.

Illustrative steps involved in providing an adaptive browse display region in which the suggested program listing is based on the current program the user is watching are shown in FIG. 13. At step 270, the program guide (or other application) may determine which program listings in the program listings database (e.g., program listings database 64 of FIG. 1) have associated attributes (such as genre, rating, actors, etc.) that best match those of the currently displayed program. At step 272, an adaptive browse display region may be displayed for each of the matching program listings.

Illustrative steps involved in providing an adaptive browse display region in which the suggested program listing is based on the last displayed program are shown in FIG. 14. At step 274, the program guide (or other application) may determine which program listings in the program listings database (e.g., program listings database 64 of FIG. 1) have associated attributes matching those of the last displayed program. The last displayed program is the last program which was viewed in substantial length (e.g., 150 minutes or more, or 75% of its length). At step 276, an adaptive browse display region may be displayed for each of the matching program listings.

Illustrative steps involved in providing an adaptive browse display region in which the suggested program listing is based on programs recently viewed by the user are shown in FIG. 15. At step 278, the

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program guide (or other application) may determine which program listings in the program listings database (e.g., program listings database 64 of FIG. 1) may have associated attributes matching those of recently-viewed programs (e.g., programs viewed in the last month, day, hour, etc.). At step 280, an adaptive browse display region may be displayed for each of the matching program listings. As with all adaptive flip and browse displays, the display region preferably contains no more than one program listing at a time, which simplifies the viewing experience.

Illustrative steps involved in determining which adaptive browse program listings have attributes similar to those of the current program are shown in FIG. 16a. At step 282, the program guide (or other application) may monitor a user's viewing activity to determine whether a program currently being displayed has been viewed for at least a predetermined period of time (e.g., ten minutes). At step 284, the program guide (or other application) may build a list of programs that have attributes similar to the attributes of the program that has been viewed for the predetermined period. The list of programs may be built using information from a program listings database maintained on the user television equipment or other suitable location (e.g., at a television distribution facility).

Illustrative steps involved in determining which adaptive browse program listings are similar to those of the last viewed program are shown in FIG. 16b. At step 286, the program guide (or other application) may determine the last displayed program that was



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substantially viewed (e.g., a channel airing a program was tuned to for seventy five percent of the program length). At step 288, the program guide (or other application) may build a list of programs that have  
5 properties similar to the properties of the last viewed program. The list of programs may be built from a program listings database such as program listings database 64 at user television equipment 58 (FIG. 1).

Illustrative steps involved in determining  
10 which adaptive browse program listings have attributes similar to those of recently viewed programming are shown in FIG. 16c. At step 290, the program guide (or other application) may monitor user program viewing activity to train an adaptive learning algorithm (e.g.,  
15 a neural network algorithm or other suitable algorithm). The training period may be, for example, several hours, several days, or more, and may be open-ended if desired. At step 292, the program guide (or other application) may build a list of programs from a  
20 program listings database using the trained adaptive learning algorithm.

As shown in FIG. 17, the program guide of the present invention may display illustrative navigator display screen 294, illustrative setup display screen  
25 296, and illustrative adaptive browse criteria settings display screen 298. Navigator display screen may include setup option 300. Setup option 300 may be selected by positioning highlight window 302 on setup option 300 and pressing an OK key on a remote control.  
30 Setup display screen 296 may be displayed when a user selects setup option 300. Setup display screen 296 may include adaptive browse criteria settings option 304

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among other user-selectable options. Adaptive browse criteria settings option 304 may be selected by positioning highlight window 306 on adaptive browse criteria settings option 304 and pressing an OK key.

- 5 Adaptive browse criteria settings display screen 298 may be displayed when a user selects adaptive browse criteria setting option 304. Adaptive browse criteria settings display screen 298 may include select algorithm option 310. Select algorithm option
- 10 310 may provide an opportunity to select as the algorithm to be used in building a list of programs an algorithm based on (for example): (a) current program attributes, (b) last-viewed program attributes, or (c) attributes determined using an adaptive learning
- 15 algorithm. The user may use option 310 to select one of these three types of algorithms. When the selected algorithm is set to current program attributes or last displayed program attributes, adaptive browse criteria settings display screen 298 may include criteria
- 20 settings display region 308. Criteria setting display region 308 may include a list of program attribute criteria (e.g., genre, title, actor, channel, rating, scheduled duration, etc.) and adjustable importance settings (weights) associated with each criteria.
- 25 Importance settings may be modified using a remote control or other suitable user input interface (e.g., track ball).

- Adaptive browse criteria settings display screen 298 may include learning time option 312.
- 30 Learning time option 312 may be used to set the minimum viewing duration of a current or last-viewed program before the attributes of the program may be used to

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build a list of programs. A user may have the opportunity to override the minimum viewing duration by selecting option 133 of FIG. 3 for manually selecting the current program for building a list of programs  
5 without waiting the minimum viewing duration. When building a list of programs matching the attributes of a current or last-viewed program, a program's attributes may be compared to attributes associated with program listings in a program listings database  
10 (e.g., program listings database 64) and may be weighted using the importance settings.

Adaptive browse criteria settings display screen 298 may include user identification option 314 for associating different adaptive browse criteria  
15 settings with each user in a household. User identification option 314 may identify the displayed settings to be associated with user Mike. User identification option 314 may be selected to scan through a list of users.

20 Illustrative steps involved in using a training algorithm to determine which adaptive browse program listings have attributes similar to viewed programming are shown in FIG. 18. At step 316, the program guide may train a neural network (for example)  
25 using information gathered while monitoring user program viewing activity. This information may include program related parameters that can be tagged to a program such as genre of viewed programs, actors of viewed programs, title of viewed programs, scheduled  
30 length of viewed programs, rating of viewed programs, percentages of the lengths of the programs view, etc. At step 318, the program guide may build a list of

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programs for the adaptive browse display using the trained neural network (e.g., by applying attributes associated with each program listing to the trained neural network to obtain an indication of a likelihood of user interest in that program).

Illustrative steps involved in training a neural network such as at step 316 of FIG. 18 are shown in more detail in FIG. 19. At step 320, the program guide (or other application) may monitor the television viewing activities of a user to gather information on the user's programming interests. At step 322, the program guide (or other application) may apply the information on the programming interests of the user to a neural network to train the neural network. The information on the programming interests may include program related parameters that can be tagged to a program such as program genre, program length, program rating, program content rating, program actors, and title, and may also involve data on the percentage of programs viewed. This information may be used as training stimuli for the neural network.

As shown in FIG. 20, if the program guide (or other application) of the present invention uses a neural network, it may display illustrative navigator display screen 324, illustrative setup display screen 326, and illustrative adaptive browse criteria settings display screen 328. Navigator display screen 324 may include setup option 330. Setup option 330 may be selected by positioning highlight window 332 on setup option 330 and pressing a remote control OK key. Setup display screen 326 may be displayed when a user selects setup option 330. Setup display screen 326 may include

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adaptive browse criteria settings option 334 and other user-selectable options. Adaptive browse criteria settings option 334 may be selected by positioning highlight window 336 on adaptive browse criteria settings option 334 and pressing an OK key.

Adaptive browse criteria settings display screen 328 may be displayed when a user selects adaptive browse criteria setting option 334. Adaptive browse criteria settings display screen 328 may include select algorithm option 338. Select algorithm option 338 may provide an opportunity to select the algorithm to be used in building a list of programs using current displayed program attributes, last displayed program attributes, or a neural network. When the selected algorithm is the neural network algorithm as shown in FIG. 20, adaptive browse criteria settings display screen 328 may include neural network criteria setting display region 340. Criteria setting display region 340 may include a list of selectable options related to user viewing activity. These may include program attributes such as genre, title, actor, channel, rating, and scheduled duration, and other criteria such as percentage of program viewed, etc. Criteria setting display region 340 may include status settings associated with each characteristic. Status settings may be set to be either enabled or disabled. When a status setting is set to be enabled, the characteristic associated with the status setting may be used in the neural network.

Adaptive browse criteria settings display screen 328 may include learning time option 342. Learning time option 342 may be used to set the minimum

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viewing duration of a program before the program related characteristics are used in training the neural network. The user may have the opportunity to override the minimum viewing duration by selecting option 133 of FIG. 3 for manually selecting the current program for training the neural network without waiting the minimum viewing duration. To build a list of programs, program attributes, and the characteristics of viewed programs are applied to the neural network to train the neural network. Subsequently, the characteristics of various current and future programs may be applied to the trained neural network. The resulting output of the trained network provides an indicator of the likelihood of user interest in those programs.

Adaptive browse criteria settings display screen 328 may include user identification option 344 for associating different settings with each user. User identification option 344 may identify the displayed settings to be associated with user Mike. A user may select user identification option 344 and scan through a list of users. In addition, user identification portion 344 may be used to log in a user to commence training the neural network based on the programs that are viewed by the user. A user may alternatively log in from a separate log-in display screen, a set-up menu, etc.

Another way in which users may adjust the network is shown in FIG. 21. As shown in FIG. 21, the program guide of the present invention may display illustrative adaptive browse criteria display screen 348 and illustrative adaptive browse criteria settings display screen 350. Adaptive browse criteria settings

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display screen 348 may include adjust neural network training option 352. Adjust neural network training option 352 may be selected by positioning a highlight window on adjust neural network training option 352 and pressing an OK key. In response, adaptive browse criteria settings display screen 350, which has adjustment option 354, may be displayed. Adjustment option 354 may include a list of programs viewed by a user and a rating associated with each program on the list. Each rating may be set or adjusted by a user to fine tune the performance of the trained neural network. Adaptive browse criteria setting display screen 350 may include add/select option 353 for adding a program as a training stimulus or selecting to ignore certain programming in training the neural network (e.g., news, sports, etc.). When a user selects add/select option 353, adaptive browse criteria setting display screen 349 may be displayed. Display screen 349 may include add/select region 351 which provides the user with an opportunity to identify a program to be used in training the neural network or to select types of programs to ignore in training the neural network.

The foregoing discussion has focused on the use of adaptive browse displays, which allows a user to browse suggested program listings on channels and at times other than the time and channel of the current program being watched while still displaying the current program. Another aspect of the invention relates to adaptive flip displays in which the user is presented with suggested listings while changing channels.

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As shown in FIG. 22, the program guide of the present invention may display adaptive flip display region 348 on illustrative television screen 350, illustrative adaptive flip display region 352 on illustrative television screen 354, and illustrative adaptive flip display region 356 on illustrative television screen 358. Adaptive flip display region 348 may be displayed on television screen 350 when a user presses an adaptive flip function key of a remote control (e.g., adaptive flip function key 100 of FIG. 2). Television screen 350 may include video of a program airing on the channel currently tuned to and being watched when adaptive flip display region 348 is invoked. Television screen 350 may include video of episode "X" of NYPD Blue which commenced airing on channel 4 at 9:00 PM and which was being watched when adaptive flip display region 348 was invoked. If desired, the adaptive flip feature may be invoked when the user starts changing channels, in which case the first channel displayed is other than the channel that was being watched when the flip mode was invoked.

Adaptive flip display region 348 may include time portion 360, channel identification portion 362, program information portion 364, up-direction portion 366, down-direction portion 368, on-screen confirmation portion 370, and option 371 for selecting the current program for determining programs for adaptive flip.

Channel identification portion 362 may include an identification of a channel. In flip mode, channel identification portion 362 includes an identification of the currently tuned channel. Program information portion 364 may include information on a



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program airing on the currently tuned channel. Time portion 360 may include an indication of the current time. Up-direction portion 366 and down-direction portion 368 may include direction arrows indicating  
5 that the user may change channels in either the up or down direction. On-screen confirmation portion 370 may provide a confirmation that the flip feature has been invoked. In addition, on-screen confirmation 370 may also provide a confirmation that the flip feature is in  
10 adaptive mode (i.e., that the adaptive flip feature has been enabled). This allows the user to toggle between adaptive flip mode and regular flip mode if desired. The user may also toggle between adaptive browse mode and regular browse mode if desired.

15 When the user presses an up-channel key, the system locates a viewing suggestion on the nearest adjacent channel in the up direction and tunes to that channel. If the user selects "use current program for adaptive flip" option 371, attributes of the current  
20 program, Episode X of NYPD Blue, may be used in determining viewing suggestions for the user. Adaptive flip display region 352 may be displayed, the channel identified in adaptive flip display region 352 may be updated, and video of the program airing on the new  
25 channel may be displayed. Adaptive flip display region 352 may include program information portion 372. Program information portion 372 may include information on a program airing on the currently tuned channel, episode "Z" of NYPD Blue. The program, episode "Z" of  
30 NYPD Blue, is a viewing suggestion determined based on the user's programming interests as determined by the user's viewing activity. Program information portion

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372 may include the scheduled time and duration of episode "Z" of NYPD Blue. Channel identification portion 374 of adaptive flip display region 352 may include an identification of the channel, KAB channel 5 120, that is associated with episode "Z" of NYPD Blue. Television screen 354 may include video of episode "Z" of NYPD Blue currently airing on KAB channel 120. Up-direction portion 388 and down-direction portion 386 may indicate that the user may change channels in 10 either the up or down directions.

Television screen 354 may include on-screen confirmation portion 376. On-screen confirmation portion 376 may be in the form of an icon providing an alternative form of on-screen confirmation for adaptive 15 mode. On-screen confirmations such as on-screen confirmation portion 370, on-screen confirmation portion 376, or any other such suitable indicator may be used in combination or separately and may be presented on any suitable display screens when 20 appropriate.

If the user is interested in tuning to the channels for additional suggested current programs, the user may again press the up-channel key. This causes the system to tune to the channel for another suggested 25 program. Adaptive flip display region 356 may then be displayed, the channel identified in adaptive flip display region 356 may be updated, and video of the program airing on the new channel may be displayed.

Adaptive flip display region 356 may include 30 program information portion 378. Program information portion 378 may include information on a suggested program, Homicide, airing on the new channel to which

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the user television equipment is current tuned. The program, Homicide, is a viewing suggestion for the current time window based on the user's programming interests as determined based on the user's viewing activity. Program information portion 378 may include the scheduled time and duration of the suggested program. Channel identification portion 380 of adaptive flip display region 356 may include an identification of the channel, KCD channel 150, associated with the suggested program (Homicide). Television screen 358 may include video of Homicide currently airing on KCD channel 150. Program suggestions for the adaptive flip feature may be based on the same types of criteria used when making program suggestions for the adaptive browse feature. In particular, the system may monitor the user's viewing activity to determine user's programming interests based on the program the user is currently viewing, the last program viewed, or the user's general viewing habits. Suggested programs may be identified by comparing the program attributes (genre, title, actors, rating, etc.) of the user's programming interests with the program listings database to locate matches.

Television screen 358 may include on-screen confirmation portion 390. On-screen confirmation portion 390 may be in the form of text or other suitable form of on-screen confirmation of the adaptive mode.

If desired, the adaptive flip feature may be provided in a configuration in which the current program is shown in a reduced size video window. As shown in FIG. 23, the program guide of the present

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invention may display illustrative television screen 392 having illustrative adaptive flip display region 394 and illustrative video display region 396, illustrative television screen 398 having illustrative adaptive flip display region 400 and illustrative video display region 402, and illustrative television screen 420. Video display region 396 of television screen 392 may include a reduced-size video of a program airing on the channel currently tuned to and being watched when adaptive flip display region 394 was invoked.

Adaptive flip display regions such as adaptive flip display region 394 typically have room for more information or options than adaptive flip display regions such as adaptive flip display region 348 of FIG. 22. Adaptive flip display region 394 may include time portion 406, channel identification portion 408, program information portion 410, up-direction portion 412, down-direction portion 414, and on-screen confirmation portion 416, and user-selectable options portion 418.

When the adaptive flip feature is invoked, channel identification portion 408 includes an identification of the currently tuned channel. Program information portion 410 includes information on the program airing on the channel identified in channel identification portion 408 (e.g., Star Trek Deep Space Nine on KDND channel 9). The channel listed in channel identification portion 408 is the same channel that is displayed in video display region 396. Time portion 406 may include an indication of the current time. Up-direction portion 412 and down-direction portion 414

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may include direction arrows indicating up and down channel flip availability.

On-screen confirmation portion 416 may provide a confirmation that the adaptive flip feature has been activated. If the program guide supports both a regular flip feature (that tunes all channels) and an adaptive flip feature, on-screen confirmation 416 may provide a confirmation when the flip feature is in adaptive mode. User-selectable options portion 418 may include user-selectable program guide options. Such options may allow the user to set parental controls, set favorites, etc.

Television screen 398 having an adaptive flip display region 400 and video display region 402 may be displayed when the user presses an up-navigation key of a remote control while adaptive flip display region 394 is displayed. Adaptive flip display region 400 may include program information portion 404. Program information portion 404 may include information on a suggested program (Babylon 5) for a viewing in the current time window. The program, Babylon 5, may be identified as a viewing suggestion based on the user's viewing activity. Program information portion 404 may include the scheduled time and duration of the program. Channel identification portion 406 of adaptive flip display region 398 may include an identification of the channel, WKAX channel 112, associated with the program, Babylon 5. Simultaneous to displaying adaptive flip display region 400, the system tunes to the channel associated with the program (KAB channel 120) and displays the program in video display region 402. The program may be displayed as a reduced size video. Up-

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direction portion 388 and down-direction portion 386 may be used to indicate availability of the flip feature in the up and down directions.

If the user presses the OK key while adaptive flip display region 400 is being displayed, the system will remove adaptive flip display region 400 and display the suggested program on a full television screen (television screen 420 in the example of FIG. 23). If desired, the suggested program may be displayed in this way when the user presses a remote control exit key of a remote control, does not take an action for a predetermined period of time, or otherwise indicates an interest in full-screen viewing. Television screen 420 may include normal-aspect-ratio video of the suggested program, Babylon 5, airing on the currently tuned channel.

Illustrative steps involved in providing an adaptive flip feature such as the adaptive flip features illustratively shown in FIG. 22 and FIG. 23 are shown in FIG. 24. At step 422, a list of suggested programs may be built for adaptive flip based on the television viewing activity of the user. The list of programs may be built from information stored in a program listings database (e.g., program listings database 64 of FIG. 24). When a user presses an up or down channel key (such as keys 92 or 94 in FIG. 2), the system tunes to the next channel on which one of the suggested programs appears and displays the adaptive flip display (step 424). For example, if the user presses the up channel key, the system tunes to the next highest channel on which a suggested program on

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the list is being displayed. Intervening channels that contain non-suggested programs are skipped.

As shown in FIG. 25, the program guide of the present invention may allow the user to adjust flip settings. The program guide may display illustrative navigator display screen 426, illustrative flip setup display screen 428, and illustrative television screen 430. Navigator display screen 426 may include flip setup option 432. Flip setup option 432 may be selected by positioning highlight window 434 on flip setup option 432 and pressing an OK key. Flip setup display screen 428 may be displayed when a user selects flip setup option 432. Flip setup display screen 428 may include adaptive flip option 436 and may include "on" and "off" portions 438 and 440 associated with adaptive flip option 436. Positioning highlight flip 442 on "on" portion 438 may place the program guide flip feature in adaptive mode (i.e., selecting "ON" enables the adaptive flip feature). Subsequently, flip setup display screen 428 may be exited and television screen 430 may be displayed. When the user presses an up or down channel key to activate flip, the program guide automatically activates the adaptive flip feature.

Illustrative steps involved in providing an on-screen confirmation of an adaptive flip feature such as on-screen adaptive flip confirmation portion 370 of FIG. 22 are shown in FIG. 26. At step 442, adaptive flip mode may be enabled for example by pressing a function key, selecting an option from a browse setup display screen, pressing a dedicated button on a set-top box, etc. At step 444, on-screen confirmation of

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adaptive flip mode may be displayed. On-screen confirmation may be displayed at step 444 when a user invokes adaptive flip. A user may invoke adaptive flip by pressing an up or down channel key, by pressing and  
5 holding an up or down channel key for a period of time, by pressing a remote control adaptive flip function key followed by an up or down channel key, etc. For the flip (or the browse) feature, if the user presses an adaptive flip (or browse) function key just prior to  
10 previously using the adaptive flip (or browse) feature, the user need not have enabled the adaptive flip (or browse) mode. If the user invokes the adaptive function by pressing a channel up or down key or other such technique, and if the program guide (or other  
15 application) supports both a regular flip (or browse) function and an adaptive flip (or browse) function, then the user may be provided with an opportunity to toggle between regular flip and browse mode (adaptive flip or browse is disabled) and adaptive flip or browse  
20 mode (adaptive flip or browse is enabled).

As shown in FIG. 27, the program guide of the present invention may display illustrative navigator display screen 446, illustrative setup display screen 448, and illustrative adaptive flip criteria settings  
25 display screen 450. Navigator display screen 446 may include setup option 460. Setup option 460 may be selected by positioning highlight region 462 on setup option 460 and pressing an OK key. Setup display screen 448 may be displayed when the user selects setup  
30 option 460. Setup display screen 448 may include adaptive flip criteria settings option 464 and other user-selectable options. Adaptive flip criteria



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settings option 464 may be selected by positioning highlight region 466 on adaptive flip criteria settings option 464 and pressing an OK key.

Adaptive flip criteria settings display screen 450 may be displayed when a user selects adaptive flip criteria settings option 464. Adaptive flip criteria settings display screen 450 may include select algorithm option 452. Select algorithm option 452 may provide the user with an opportunity to select the algorithm to be used in building the list of suggested programs for the adaptive flip feature using current program attributes, using last displayed program attributes, or using an adaptive learning algorithm.

When the selected algorithm is current program attributes or last displayed program attributes, adaptive flip criteria settings display screen 450 may include criteria setting display region 454. Criteria setting display region 454 may include a list of program attribute criteria (e.g., genre, title, actor, channel, rating, scheduled duration, etc.) and may include adjustable importance settings associated with each program attribute criteria. Importance settings may be modified by the user using a remote control or other suitable form of data entry.

Adaptive flip criteria settings display screen 450 may also include learning time option 456. Learning time option 456 may be used to set the minimum viewing duration for the current or last-viewed program after which the attributes of the program are used to build the list of suggested programs. A user may have the opportunity to override the minimum viewing

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duration by selecting option 371 of FIG. 22 for manually selecting the current program for building a list of programs without waiting the minimum viewing duration. To build the list of suggested programs, attributes of the currently viewed or last-viewed program may be weighted using the importance settings. The resulting weighted attributes may be compared to attributes associated with program listings in a program listings database (e.g., program listings database 64). The program listings with attributes that most closely match the weighted attributes are used as program suggestions.

Adaptive flip criteria settings display screen 450 may include user identification option 458 for associating different adaptive flip criteria settings with each user. User identification option 458 may identify the displayed settings to be associated with user Mike. User identification option 458 may be selected by the user, so that the user may scan through a list of users. Later, when a given user is using the program guide (or other application), the user may direct the system to use that user's settings (including that user's adaptive flip and adaptive browse criteria settings).

As shown in FIG. 28, the program guide of the present invention may display illustrative navigator display screen 459, illustrative setup display screen 460, and illustrative adaptive flip criteria settings display screen 463. Navigator display screen 459 may include setup option 464. Setup option 464 may be selected by positioning highlight region 466 on setup option 464 and pressing an OK key. Setup display

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screen 460 may be displayed when a user selects setup option 464. Setup display screen 460 may include adaptive flip criteria settings option 468 and other user-selectable options. Adaptive flip criteria settings option 468 may be selected by positioning highlight region 470 on adaptive flip criteria settings option 468 and pressing an OK key.

Adaptive flip criteria settings display screen 462 may be displayed when a user selects adaptive flip criteria settings option 460. Adaptive flip criteria settings display screen 462 may include select algorithm option 476. Select algorithm option 476 may provide an opportunity for the user to select the algorithm to be used to building the list of suggested programs for the adaptive browse feature using current program attributes, last displayed program attributes, or a neural network. When the selected algorithm is the neural network algorithm, adaptive browse criteria settings display screen 462 may include neural network criteria setting display option 474. Criteria setting display option 474 may include a list of program attributes (e.g., genre, title, actor, channel, rating, scheduled duration, etc.), other criteria such as percentage of program viewed, and status settings associated with each criteria. The list of program attributes may also include other related parameters that can be tagged to a program. Status settings may be set to be either enabled or disabled. A listed criteria may be used in a neural network when the associated status setting is set to enabled.

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Adaptive flip criteria settings display screen 462 may also include learning time option 472. Learning time option 472 may be used to set the minimum time that a program must be viewed before the program-  
5 related criteria may be used for training the neural network. The user may have the opportunity to override the minimum viewing duration by selecting option 371 of FIG. 22 for manually selecting the current program for training the neural network without waiting the minimum  
10 viewing duration. Criteria of viewed programs may be applied to a neural network to train the neural network. To build a list of suggested programs, the program attributes of various current and future programs may be applied to the trained neural network  
15 to provide an indicator of a likelihood of user interest in each of these programs.

Adaptive browse criteria settings display screen 462 may include user identification option 480 for associating a different settings with users. For  
20 example, user identification option 480 may identify the displayed settings as being associated with user Mike. User identification option 480 may be used to scan through a list of program guide users. This allows the settings for any desired user to be changed.

25 As shown in FIG. 29, the program guide of the present invention may display illustrative adaptive flip criteria settings display screen 482 and illustrative adaptive flip criteria settings display screen 486. Adaptive flip criteria settings display  
30 screen 482 may include adjust neural network training option 484. Adjust neural network training option 484 may be selected by positioning a highlight window on

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adjust neural network training option 484 and pressing an OK key. In response, adaptive flip criteria settings display screen 486 may be displayed which includes adjustment option 488. Adjustment option 488

5 may include a list of programs viewed by a user and a rating associated with each program on the list. Each rating may be adjusted by the user to tune the performance of the trained neural network. Adaptive flip criteria setting display screen 486 may include

10 add/select option 483 for adding a program as a training stimulus or selecting to ignore certain programming in training the neural network. When a user selects add/select option 483, adaptive flip criteria setting display screen 485 may be displayed.

15 Display screen 485 may include add/select region 487 which provides the user with an opportunity to identify a program to be used in training the neural network or to select types of programs to ignore in training the neural network.

20 The program guide may allow a user to access a list of suggested programs. For example, as shown in FIG. 29, the program guide may display grid display screen 500, pop-up display region 502 on television screen 504, or grid display region 506 on television

25 screen 508. Grid display screen 500, pop-up display region 502, and grid display region 506 may each include program listings for suggested programs determined as discussed above based on the attributes of user viewed programming (e.g., the current program,

30 the last program viewed, programming in general that the user has recently viewed, or the program attributes of some other suitable set of programming). User

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access to grid display screen 500, pop-up display screen 502, and grid display region 506 may be provided by selecting an "other shows" option 510, by selecting a list option 512, or by pressing a predetermined  
5 remote control key.

The foregoing is merely illustrative of the principles of this invention and various modifications can be made by those skilled in the art without departing from the scope and spirit of the invention.

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What is Claimed is:

1. A method for aiding a user who is viewing a program airing on a current channel in identifying another program to view, comprising:

monitoring which television programming is viewed by the user;

determining at least one program attribute of the monitored television programming;

identifying program listings for programs that are suggested based on the program attribute; and

allowing the user to browse the program listings for the suggested programs by displaying the program airing on the current channel and simultaneously displaying a display region containing the program listing for one of the suggested programs.

2. The method of claim 1 wherein the determining comprises determining whether the program airing on the current channel has been viewed for a predetermined period.

3. The method of claim 1 wherein the program attribute is selected from the consisting of program title, program actors, program duration, program genre, program channel, scheduled program duration, program rating, and program content rating.

4. The method of claim 1 further comprising:

displaying available program attributes;  
and

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allowing the user to select which available program attributes are to be used in identifying program listings.

5. The method of claim 1 wherein the identifying further comprises identifying program listings based on plural program attributes.

6. The method of claim 1 further comprising associating a user-selectable weight with each program attribute.

7. The method of claim 6 wherein the identifying comprises identifying the program listing based on the plural determined attributes and associated weights.

8. The method of claim 1 wherein the determining comprises determining the last displayed program which was viewed for a substantial portion of the program length.

9. The method of claim 1 further comprising:

determining from the monitored television programming which earlier programs were viewed;

determining when the earlier programs were viewed; and

determining how long each earlier program was viewed.



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10. The method of claim 9 wherein identifying comprises:

training a neural network using as training stimuli the determined program attributes, which programs were viewed, how long the programs were viewed, and when the programs were viewed; and

applying attributes of available programs to the trained neural network to identify program listings.

11. The method of claim 10 further comprising calibrating the trained neural network to match viewing interests.

12. The method of claim 11 further comprising selecting to use attributes of a specific program in training the neural network.

13. The method of claim 11 further comprising ignoring selected program types in training the neural network.

14. The method of claim 1 further comprising selectively associating with each of plural users a different program attribute to be determined.

15. The method of claim 1 wherein the display region is an overlay.

16. The method of claim 1 wherein the displaying comprises displaying a video display region having compressed video of the program airing on the

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current channel and simultaneously displaying the display region containing the identified program listing.

17. The method of claim 1 wherein the displaying further comprising displaying an on-screen confirmation portion confirming that user program identifying is being aided.

18. The method of claim 17 wherein the displaying on-screen confirmation portion comprises displaying an iconic on-screen confirmation portion.

19. The method of claim 17 wherein the displaying on-screen confirmation portion comprises displaying a textual on-screen confirmation portion.

20. The method of claim 1 further comprising allowing the user to select the program listing contained in the display region.

21. The method of claim 20 further comprising displaying one of the suggested programs in response to the user selecting the program listing contained in the display region.

22. The method of claim 20 further comprising displaying selectable options for accessing one of the suggested programs in response to the user selecting the program listing contained in the display region.

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23. The method of claim 1 further comprising selectively enabling user program identifying that is aided.

24. The method of claim 1 further comprising allowing the user to invoke the displaying.

25. The method of claim 1 wherein the identifying comprises building a list of program listings from a program listings database stored at user television equipment.

26. The method of claim 1 further comprising allowing the user to select to use at least one attribute of the current program in identifying program listings.

27. A system for aiding a user who is viewing a program airing on a current channel in identifying another program to view, comprising:

means for monitoring which television programming is viewed by the user;

means for determining at least one program attribute of the monitored television programming;

means for identifying program listings for programs that are suggested based on the program attribute; and

means for allowing the user to browse the program listings for the suggested programs by displaying the program airing on the current channel and simultaneously displaying a display region

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containing the program listing for one of the suggested programs.

28. The system of claim 27 wherein said means for determining determines whether the program airing on the current channel has been viewed for a predetermined period.

29. The system of claim 27 wherein the program attribute is selected from the consisting of program title, program actors, program duration, program genre, program channel, scheduled program duration, program rating, and program content rating.

30. The system of claim 27 further comprising:

means for displaying available program attributes; and

means for allowing the user to select which available program attributes are to be used in identifying program listings.

31. The system of claim 27 wherein said means for identifying identifies program listings based on plural program attributes.

32. The system of claim 27 further comprising means for associating a user-selectable weight with each program attribute.

33. The system of claim 29 wherein said means for identifying identifies the program listing

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based on the plural determined attributes and associated weights.

34. The system of claim 27 wherein said means for determining determines the last displayed program which was viewed for a substantial portion of the program length.

35. The system of claim 27 further comprising:

means for determining from the monitored television programming which earlier programs were viewed;

means for determining when the earlier programs were viewed; and

means for determining how long each earlier program was viewed.

36. The system of claim 32 wherein said means for identifying comprises:

means for training a neural network using as training stimuli the determined program attributes, which programs were viewed, how long the programs were viewed, and when the programs were viewed; and

means for applying attributes of available programs to the trained neural network to identify program listings.

37. The system of claim 36 further comprising means for calibrating the trained neural network to match viewing interests.

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38. The system of claim 37 further comprising means for selecting to use attributes of a specific program in training the neural network.

39. The system of claim 37 further comprising means for ignoring selected program types in training the neural network.

40. The system of claim 27 further comprising means for selectively associating with each of plural users a different program attribute to be determined.

41. The system of claim 27 wherein the display region is an overlay.

42. The system of claim 27 wherein said means for displaying displays a video display region having compressed video of the program airing on the current channel and simultaneously displaying a display region containing the program listing for one of the suggested programs.

43. The system of claim 27 further comprising means for displaying an on-screen confirmation portion confirming that user program identifying is being aided.

44. The system of claim 43 wherein said means for displaying the on-screen confirmation portion displays an iconic on-screen confirmation portion.

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45. The system of claim 43 wherein said means for displaying the on-screen confirmation portion displays a textual on-screen confirmation portion.

46. The system of claim 27 further comprising means for allowing the user to select the program listing contained in the display region.

47. The system of claim 46 further comprising means for displaying one of the suggested programs in response to the user selecting the program listing contained in the display region.

48. The system of claim 46 further comprising means for displaying selectable options for accessing one of the suggested programs in response to the user selecting the program listing contained in the display region.

49. The system of claim 27 further comprising means for selectively enabling user program identifying that is aided.

50. The system of claim 27 further comprising means for allowing the user to invoke the displaying of the display region by said means for displaying.

51. The system of claim 27 wherein said means for identifying comprises means for building a list of program listings from a program listings database stored at user television equipment.

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52. The system of claim 27 further comprising means for allowing the user to select to use at least one attribute of the current program in identifying program listings.

53. A system for aiding a user who is viewing a program airing on a current channel in identifying another program to view, comprising:

user television equipment on which an interactive television program guide is at least partially implemented, wherein the user television equipment is configured to monitor which television programming is viewed by the user, determine at least one program attribute of the monitored television programming, and identify program listings for programs that are suggested based on the program attribute, and the user television equipment is further configured to allow the user to browse the program listings for the suggested programs by displaying the program airing on the current channel and simultaneously displaying a display region containing the program listing for one of the suggested programs.

54. The system of claim 53 wherein the user television equipment is configured to determine whether the program airing on the current channel has been viewed for a predetermined period.

55. The system of claim 53 wherein the program attribute is selected from the consisting of program title, program actors, program duration,



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program genre, program channel, scheduled program duration, program rating, and program content rating.

56. The system of claim 53 wherein the user television equipment is further configured to display available program attributes, and to allow the user to select which available program attributes are to be used in identifying program listings.

57. The system of claim 53 wherein the user television equipment configured to identify program listings based on plural program attributes.

58. The system of claim 53 wherein the user television equipment is further configured to associate a user-selectable weight with each program attribute.

59. The system of claim 58 wherein the user television equipment is configured to identify the program listing based on the plural determined attributes and associated weights.

60. The system of claim 52 wherein the user television equipment is configured to determine the last displayed program which was viewed for a substantial portion of the program length.

61. The system of claim 52 wherein the user television equipment is further configured to determine from the monitored television programming which earlier programs were viewed, determine when the earlier

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programs were viewed, and determine how long each earlier program was viewed.

62. The system of claim 61 wherein the user television equipment is further configured to train a neural network using as training stimuli the determined program attributes, which programs were viewed, how long the programs were viewed, and when the programs were viewed, and is further configured to apply attributes of available programs to the trained neural network to identify program listings.

63. The system of claim 62 wherein the user television equipment is further configured to calibrate the trained neural network to match viewing interests.

64. The system of claim 63 wherein the user television equipment is further configured to select to use attributes of a specific program in training the neural network.

65. The system of claim 63 wherein the user television equipment is configured to ignore selected program types in training the neural network.

66. The system of claim 52 wherein the user television equipment is further configured to selectively associate with each of plural users a different program attribute to be determined.

67. The system of claim 52 wherein the display region is an overlay.

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68. The system of claim 52 wherein the user television equipment is configured to display a video display region having compressed video of the program airing on the current channel and simultaneously displays the display region containing the program listing for one of the suggested programs.

69. The system of claim 52 wherein the user television equipment is further configured to display an on-screen confirmation portion confirming that user program identifying is being aided.

70. The system of claim 69 wherein the user television equipment is configured to display an iconic on-screen confirmation portion.

71. The system of claim 69 wherein the user television equipment is configured to display a textual on-screen confirmation portion.

72. The system of claim 52 wherein the user television equipment is further configured to allow the user to select the program listing contained in the display region.

73. The system of claim 72 wherein the user television equipment is further configured to display one of the suggested programs in response to the user selecting the program listing contained in the display region.

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74. The system of claim 72 wherein the user television equipment is further configured to display selectable options for accessing one of the suggested programs in response to the user selecting the program listing contained in the display region.

75. The system of claim 52 wherein the user television equipment is further configured to enable user program identifying that is aided.

76. The system of claim 75 wherein the user television equipment is further configured to allow the user to invoke the displaying of the display region.

77. The system of claim 75 wherein the user television equipment is configured to build a list of program listings from a program listings database stored at the user television equipment.

78. The system of claim 52 wherein the user television equipment is further configured to allow the user to select to use at least one attribute of the current program in identifying in identifying program listings.

79. A method for aiding a user in identifying a program to view, comprising:

monitoring which television programming is viewed by the user;

determining at least one program attribute of the monitored television programming;

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identifying program listings for current programs based on the program attribute;

allowing the user to tune to only those channels that are associated with the identified program listings when the user changes channels to display current programs; and

displaying the identified program listing for each current program at the same time that each current program is displayed.

80. The method of claim 79 wherein the determining comprises determining whether a currently displayed program has been viewed for a predetermined period.

81. The method of claim 79 wherein the program attribute may be selected from the consisting of program title, program actors, program duration, program genre, program channel, scheduled program duration, program rating, and program content rating.

82. The method of claim 79 further comprising:

displaying available program attributes;

and

allowing the user to select which available program attributes are to be used in identifying program listings.

83. The method of claim 79 wherein the identifying further comprises identifying program listings based on plural program attributes.

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84. The method of claim 79 further comprising associating a user-selectable weight with each program attribute.

85. The method of claim 84 wherein the identifying comprises identifying the program listing based on the plural determined attributes and associated weights.

86. The method of claim 79 wherein the determining comprises determining the last displayed program which was viewed for a substantial portion of the program length.

87. The method of claim 79 further comprising:

determining from the monitored television programming which earlier programs were viewed;

determining when the earlier programs were viewed; and

determining how long each earlier program was viewed.

88. The method of claim 79 wherein identifying comprises:

training a neural network using as training stimuli the determined program attributes, which programs were viewed, how long the programs were viewed, and when the programs were viewed; and

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applying attributes of available programs to the trained neural network to identify program listings.

89. The method of claim 88 further comprising calibrating the trained neural network to match viewing interests.

90. The method of claim 89 further comprising selecting to use attributes of a specific program in training the neural network.

91. The method of claim 89 further comprising ignoring selected program types in training the neural network.

92. The method of claim 79 further comprising selectively associating with each of plural users a different program attribute to be determined.

93. The method of claim 79 wherein the displaying comprises displaying a display region for the identified program listing.

94. The method of claim 79 wherein the displaying comprises displaying the identified program listing for each current program at the same time that a video display region having compressed video for each current program is displayed.

95. The method of claim 79 wherein the displaying further comprising displaying an on-screen

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confirmation portion confirming that user program identifying is being aided.

96. The method of claim 95 wherein the displaying on-screen confirmation portion comprises displaying an iconic on-screen confirmation portion.

97. The method of claim 95 wherein the displaying on-screen confirmation portion comprises displaying a textual on-screen confirmation portion.

98. The method of claim 79 further comprising allowing the user to select the displayed program listing.

99. The method of claim 79 further comprising selectively enabling user program identifying that is aided.

100. The method of claim 79 further comprising allowing the user to invoke the displaying.

101. The method of claim 79 wherein the identifying comprises building a list of program listings from a program listings database stored at user television equipment.

102. The method of claim 79 further comprising selecting to use attributes of an initially displayed program in identifying program listings.



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103. A system for aiding a user in identifying a program to view, comprising:

means for monitoring which television programming is viewed by the user;

means for determining at least one program attribute of the monitored television programming;

means for identifying program listings for current programs based on the program attribute;

means for allowing the user to tune to only those channels that are associated with the identified program listings when the user changes channels to display current programs; and

means for displaying the identified program listing for each current program at the same time that each current program is displayed.

104. The system of claim 103 wherein said means for determining determines whether a currently displayed program has been viewed for a predetermined period.

105. The system of claim 103 wherein the program attribute may be selected from the consisting of program title, program actors, program duration, program genre, program channel, scheduled program duration, program rating, and program content rating.

106. The system of claim 103 further comprising:

means for displaying available program attributes; and

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means for allowing the user to select which available program attributes are to be used in identifying program listings.

107. The system of claim 103 wherein said means for identifying identifies program listings based on plural program attributes.

108. The system of claim 103 further comprising means for associating a user-selectable weight with each program attribute.

109. The system of claim 108 wherein said means for identifying identifies the program listing based on the plural determined attributes and associated weights.

110. The system of claim 103 wherein said means for determining determines the last displayed program which was viewed for a substantial portion of the program length.

111. The system of claim 103 further comprising:

means for determining from the monitored television programming which earlier programs were viewed;

means for determining when the earlier programs were viewed; and

means for determining how long each earlier program was viewed.

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112. The system of claim 111 wherein said means for identifying comprises:

means for training a neural network using as training stimuli the determined program attributes, which programs were viewed, how long the programs were viewed, and when the programs were viewed; and

means for applying attributes of available programs to the trained neural network to identify program listings.

113. The system of claim 112 further comprising means for calibrating the trained neural network to match viewing interests.

114. The system of claim 113 further comprising means for selecting a specific program to use attributes of a specific program in training the neural network.

115. The system of claim 113 further comprising means for ignoring selected program types in training the neural network.

116. The system of claim 103 further comprising means for selectively associating with each of plural users a different program attribute to be determined.

117. The system of claim 103 wherein said means for displaying comprises means for displaying a display region for the identified program listing.

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118. The system of claim 103 wherein said means for displaying displays the identified program listing for each current program at the same time that a video display region having compressed video for each current program is displayed.

119. The system of claim 103 wherein said means for displaying comprises means for displaying an on-screen confirmation portion confirming that user program identifying is being aided.

120. The system of claim 119 wherein the on-screen confirmation portion is iconic.

121. The system of claim 119 wherein the on-screen confirmation portion is textual.

122. The system of claim 103 further comprising means for allowing the user to select the displayed program listing.

123. The system of claim 103 further comprising means for selectively enabling user program identifying that is aided.

124. The system of claim 103 further comprising means for allowing the user to invoke the displaying.

125. The system of claim 103 wherein said means for identifying comprises means for building a

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list of program listings from a program listings database stored at user television equipment.

126. The system of claim 103 further comprising means for selecting to use attributes of an initially displayed program in identifying program listings.

127. A system for aiding a user in identifying a program to view, comprising:

user television equipment on which an interactive television program guide is at least partially implemented, wherein the user television equipment is configured to monitor which television programming is viewed by the user, determine at least one program attribute of the monitored television programming, identify program listings for current programs based on the program attribute, allow the user to tune to only those channels that are associated with the identified program listings when the user changes channels to display current programs, and display the identified program listing for each current program at the same time that each current program is displayed.

128. The system of claim 127 wherein the user television equipment is configured to determine whether a currently displayed program has been viewed for a predetermined period.

129. The system of claim 127 wherein the program attribute may be selected from the consisting of program title, program actors, program duration,

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program genre, program channel, scheduled program duration, program rating, and program content rating.

130. The system of claim 127 wherein the user television equipment is further configured to display available program attributes, and to allow the user to select which available program attributes are to be used in identifying program listings.

131. The system of claim 127 wherein the user television equipment is configured to identify program listings based on plural program attributes.

132. The system of claim 127 wherein the user television equipment is further configured to associate a user-selectable weight with each program attribute.

133. The system of claim 132 wherein the user television equipment is configured to identify the program listing based on the plural determined attributes and associated weights.

134. The system of claim 127 wherein the user television equipment is configured to determine the last displayed program which was viewed for a substantial portion of the program length.

135. The system of claim 127 wherein the user television equipment is further configured to determine from the monitored television programming which earlier programs were viewed, determine when the earlier

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programs were viewed, and determine how long each earlier program was viewed.

136. The system of claim 135 wherein the user television equipment is further configured to train a neural network using as training stimuli the determined program attributes, which programs were viewed, how long the programs were viewed, and when the programs were viewed, and to apply program attributes of available programs to the trained neural network to identify program listings.

137. The system of claim 136 wherein the user television equipment is further configured to calibrate the trained neural network to match viewing interests.

138. The system of claim 137 wherein the user television equipment is further configured to select a specific program for using attributes of the specific program in training the neural network.

139. The system of claim 137 wherein the user television equipment is configured to ignore selected program types in training the neural network.

140. The system of claim 127 wherein the user television equipment is further configured to selectively associate with each of plural users a different program attribute to be determined.

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141. The system of claim 127 wherein the user television equipment is further configured to display a display region for the identified program listing.

142. The system of claim 127 wherein the user television equipment is configured to display the identified program listing for each current program at the same time that a video display region having compressed video for each current program is displayed.

143. The system of claim 127 wherein the user television equipment is further configured to display an on-screen confirmation portion confirming that user program identifying is being aided.

144. The system of claim 143 wherein the on-screen confirmation portion is iconic.

145. The system of claim 143 wherein the on-screen confirmation portion is textual.

146. The system of claim 127 wherein the user television equipment is further configured to allow the user to select the displayed program listing.

147. The system of claim 127 wherein the user television equipment is further configured to selectively enable user program identifying that is aided.



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148. The system of claim 127 wherein the user television equipment is further configured to allow the user to invoke the displaying.

149. The system of claim 127 wherein the user television equipment is configured to build a list of program listings from a program listings database stored at user television equipment.

150. The system of claim 127 wherein the user television equipment is further configured to select an initially displayed program for using attributes of the initially displayed program in identifying program listings.

151. An interactive television program guide system for aiding a user in identifying programs for viewing, comprising:

user television equipment on which an interactive television program guide is at least partially implemented, wherein:

the user television equipment is configured to display a television screen having video of a current program airing on a current channel;

the user television equipment is configured to allow the user to sequentially browse program listings for available programming by selectively displaying for each program listing a display region on the television screen;

the user television equipment is configured to limit which program listings are displayed in the display region based on various

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program attributes of television programs that have been viewed by the user; and

the user television equipment is configured to allow the user to adjust the relative importance of the various program attributes that are used to limit the displayed program listings.

152. The system of claim 151 wherein the user television equipment is configured to limit which program listings by building a list of program listings from a program listings database based on the various program attributes of television programs that have been viewed by the user.

153. The system of claim 151 wherein the user television equipment is configured to allow the user to select the displayed program listing to access the program associated with the displayed program listing.

154. The system of claim 151 wherein the user television equipment is configured to limit which program listings are displayed by using a neural network.

155. The system of claim 151 wherein the display region is an overlay.

156. An interactive television program guide system for aiding a user in identifying programs for viewing, comprising:

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means for displaying a television screen having video of a current program airing on a current channel;

means for allowing the user to sequentially browse program listings for available programming by selectively displaying for each program listing a display region on the television screen;

means for limiting which program listings are displayed in the display region based on various program attributes of television programs that have been viewed by the user; and

means for allowing the user to adjust the relative importance of various program attributes that are used to limit the displayed program listings.

157. The system of claim 156 wherein said means for limiting comprises means for building a list of program listings from a program listings database based on the various program attributes of television programs that have been viewed by the user.

158. The system of claim 156 further comprising means for allowing the user to select the displayed program listing to access the program associated with the displayed program listing.

159. The system of claim 156 wherein said means for limiting comprises means for using a neural network to limit which program listings are displayed.

160. The system of claim 156 wherein the display region is an overlay.

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161. In an interactive television program guide system, a method for aiding a user in identifying programs for viewing, comprising:

displaying a television screen having video of a current program airing on a current channel;

allowing the user to sequentially browse program listings for available programming by selectively displaying for each program listing a display region on the television screen;

limiting which program listings are displayed in the display region based on various program attributes of television programs that have been viewed by the user; and

allowing the user to adjust the relative importance of various program attributes that are used to limit the displayed program listings.

162. The method of claim 161 wherein the limiting comprises building a list of program listings from a program listings database based on the various program attributes of television programs that have been viewed by the user.

163. The method of claim 161 further comprising allowing the user to select the displayed program listing to access the program associated with the displayed program listing.

164. The method of claim 161 wherein limiting comprises using a neural network to limit which program listings are displayed.

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165. The method of claim 161 wherein the display region is an overlay.

166. An interactive television program guide system for aiding a user in identifying programs for viewing, comprising:

user television equipment on which an interactive television program guide is at least partially implemented, wherein:

the user television equipment is configured to allow the user to sequentially flip through current programs and related program listings by selectively displaying a television screen having video of one of the current programs and at the same time displaying a display region on the television screen having the related program listing for the displayed program;

the user television equipment is configured to limit which current programs are displayed and which related program listings are simultaneously displayed in the television screen based on various program attributes of television programs that have been viewed by the user; and

the user television equipment is configured to allow the user to adjust the relative importance of the various program attributes that are used to limit the displayed current program.

167. The system of claim 166 wherein the user television equipment is configured to limit by building a list of programs from a program listings database

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based on the various program attributes of television programs that have been viewed by the user.

168. The system of claim 166 wherein the user television equipment is configured to limit which program listings are displayed by using a neural network.

169. The system of claim 166 wherein the display region is an overlay.

170. An interactive television program guide system for aiding a user in identifying programs for viewing, comprising:

means for allowing the user to sequentially flip through current programs and related program listings by selectively displaying a television screen having video of one of the current programs and at the same time displaying a display region on the television screen having the related program listing for the displayed program;

means for limiting which current programs are displayed and which related program listings are simultaneously displayed in the television screen based on various program attributes of television programs that have been viewed by the user; and

means for allowing the user to adjust the relative importance of the various program attributes that are used to limit the displayed current program.

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171. The system of claim 170 wherein said means for limiting comprises means for building a list of program listings from a program listings database based on the various program attributes of television programs that have been viewed by the user.

172. The system of claim 170 wherein said means for limiting comprises means for using a neural network to limit which programs and program listings are displayed.

173. The system of claim 170 wherein the display region is an overlay.

174. An interactive television program guide system for aiding a user in identifying programs for viewing, comprising:

- allowing the user to sequentially flip through current programs and related program listings by selectively displaying a television screen having video of one of the current programs and at the same time displaying a display region on the television screen having the related program listing for the displayed program;

- limiting which current programs are displayed and which related program listings are simultaneously displayed in the television screen based on various program attributes of television programs that have been viewed by the user; and

- allowing the user to adjust the relative importance of the various program attributes that are used to limit the displayed current program.

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175. The method of claim 174 wherein the limiting comprises building a list of program listings from a program listings database based on the various program attributes of television programs that have been viewed by the user.

176. The method of claim 174 wherein limiting comprises using a neural network to limit which program listings are displayed.

177. The method of claim 174 wherein the display region is an overlay.



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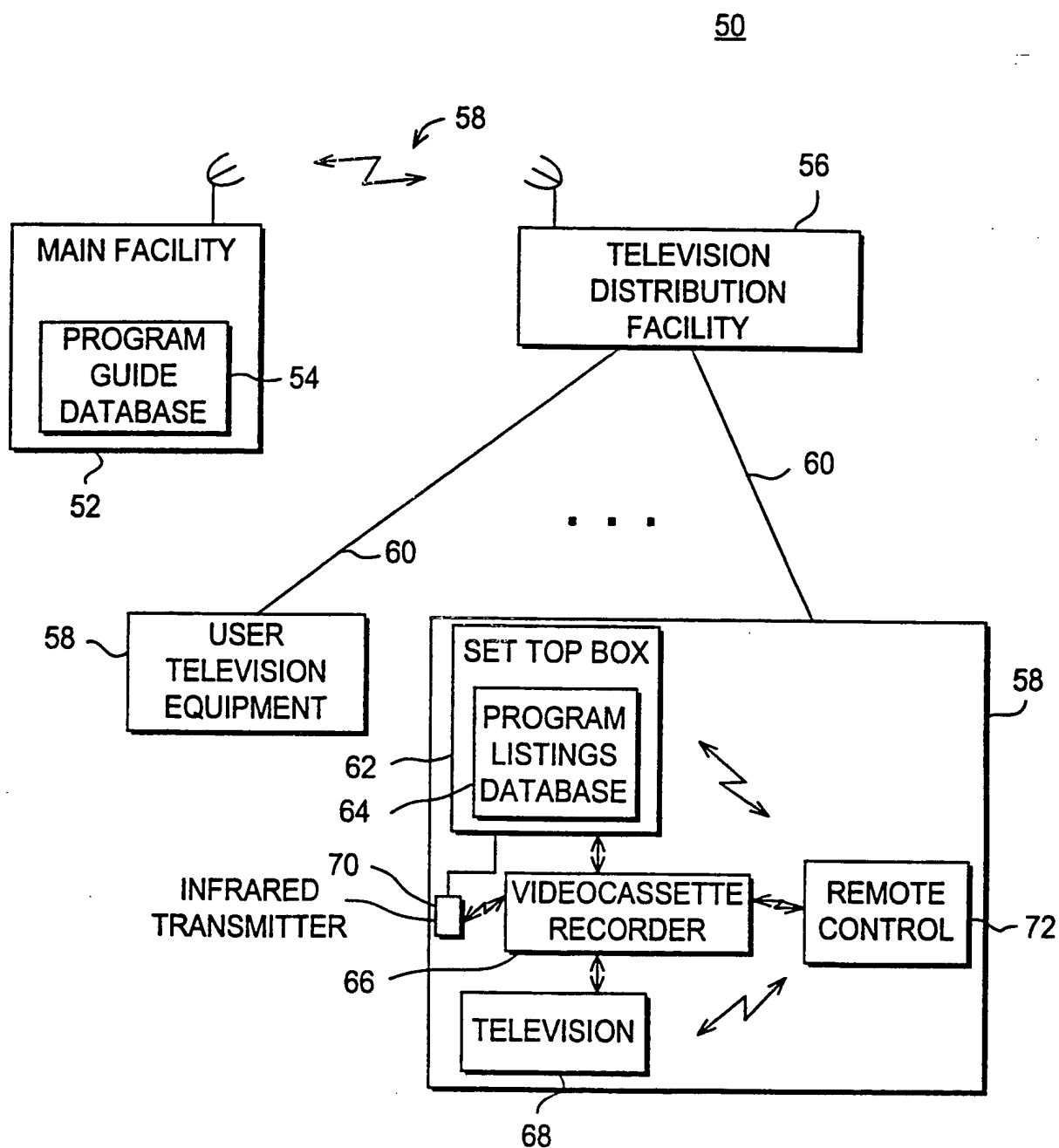


FIG. 1

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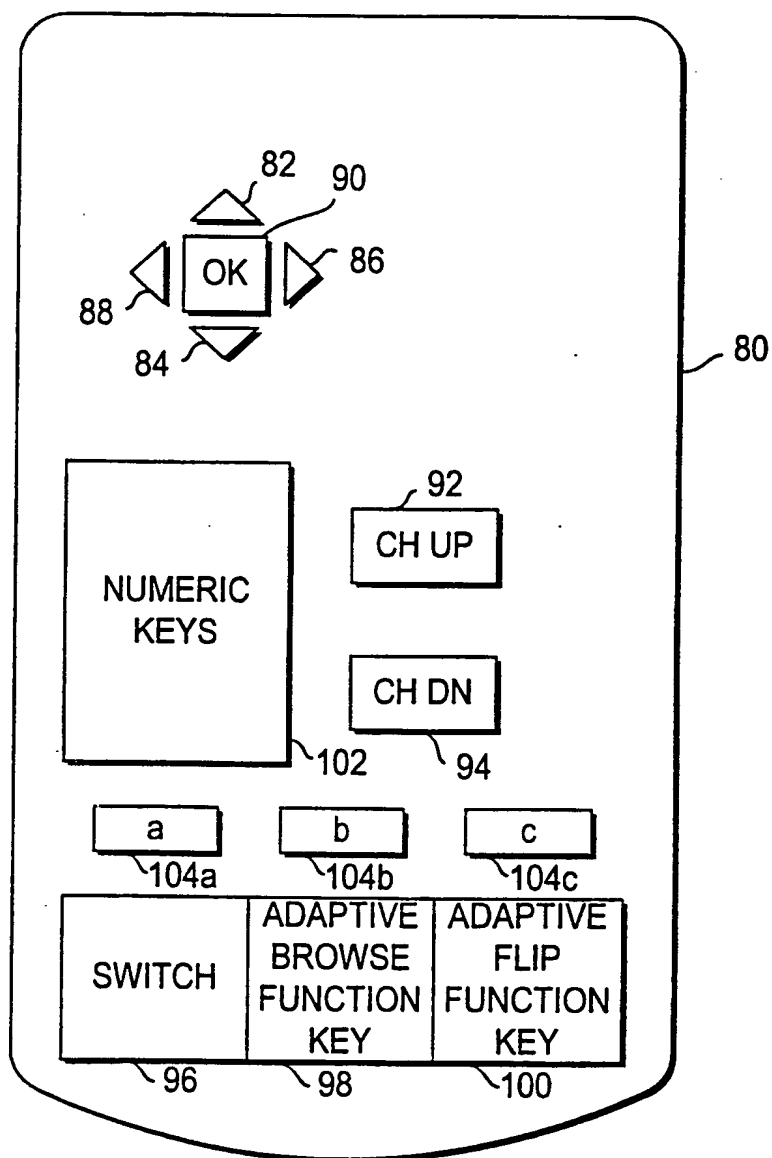


FIG. 2

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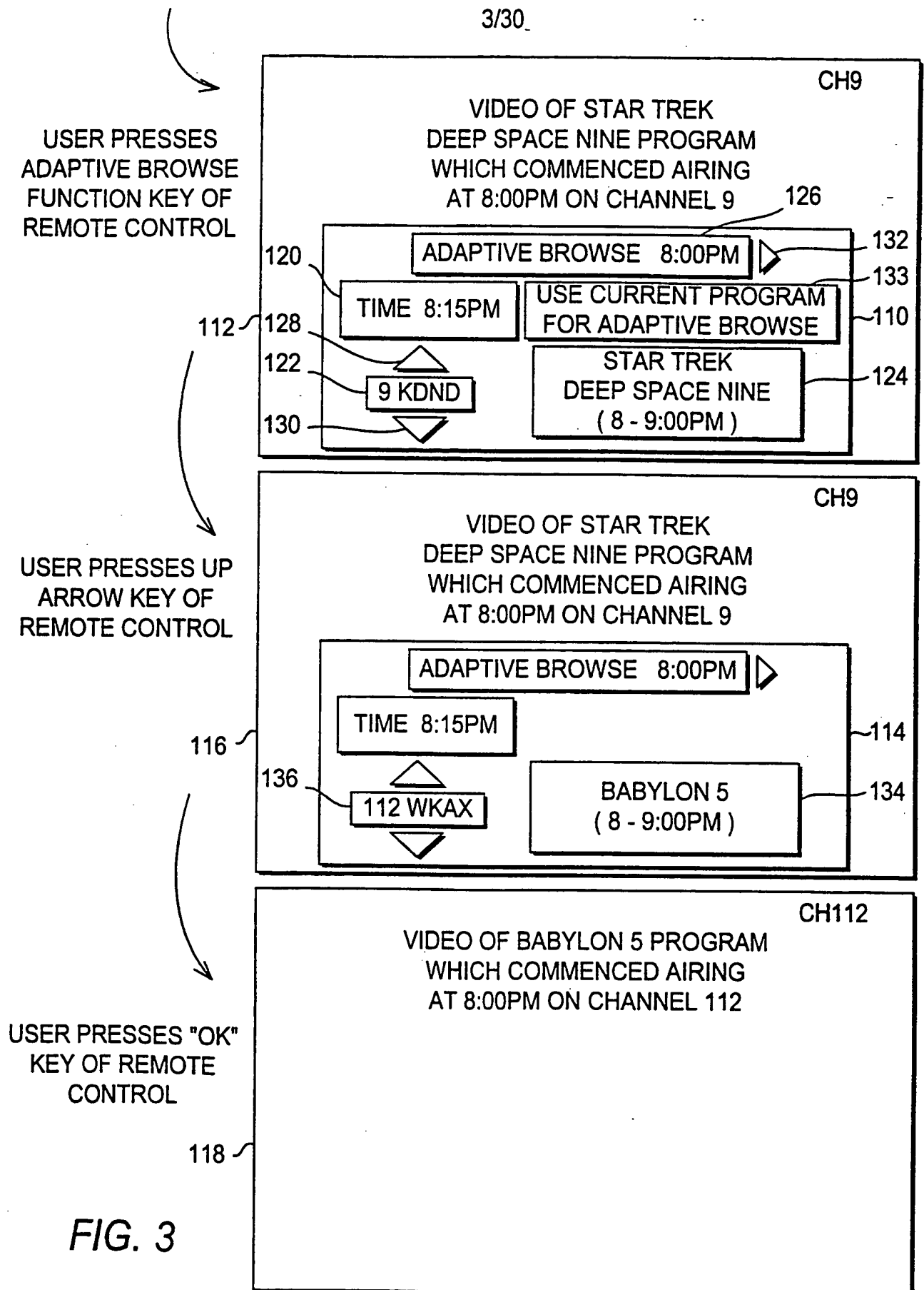


FIG. 3

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USER PRESSES AND  
HOLDS A DIRECTIONAL  
ARROW KEY OF THE  
REMOTE CONTROL  
DEPRESSED FOR A  
PREDETERMINED  
PERIOD

USER PRESSES RIGHT  
ARROW KEY OF  
REMOTE CONTROL

USER PRESSES "OK"  
KEY OF REMOTE  
CONTROL

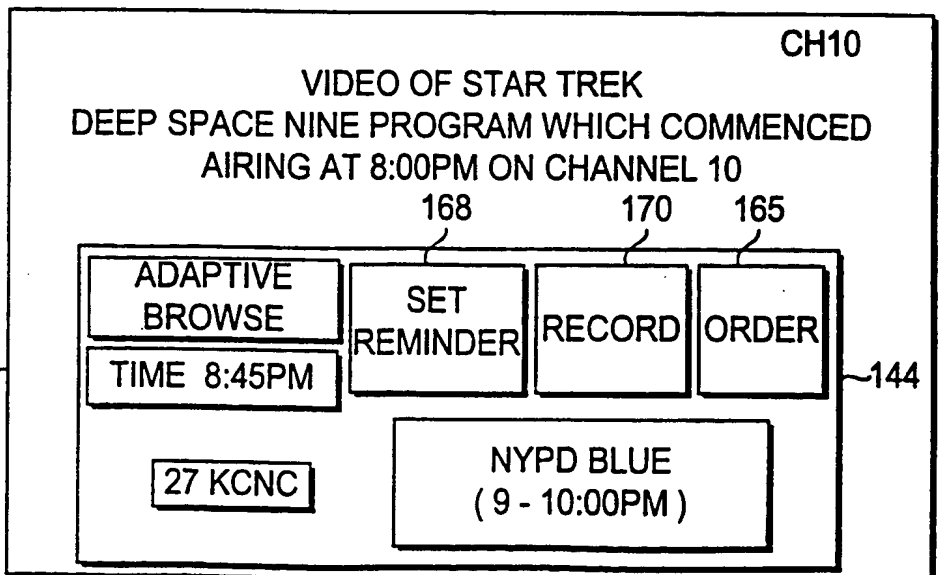
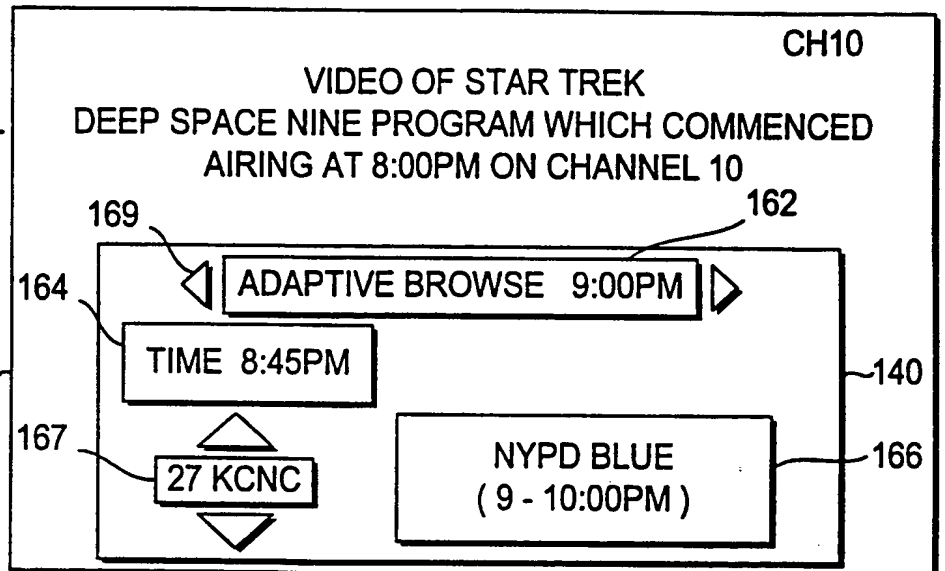
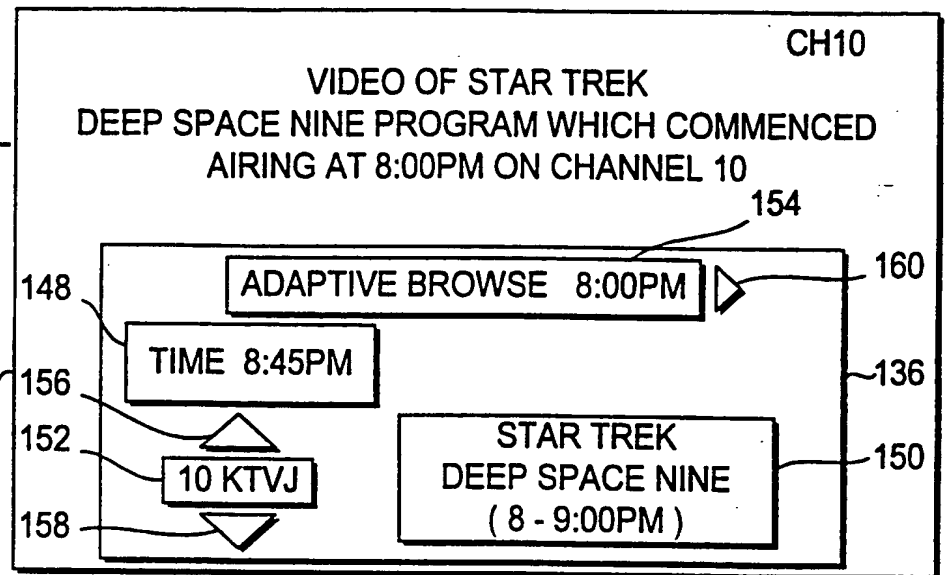


FIG. 4

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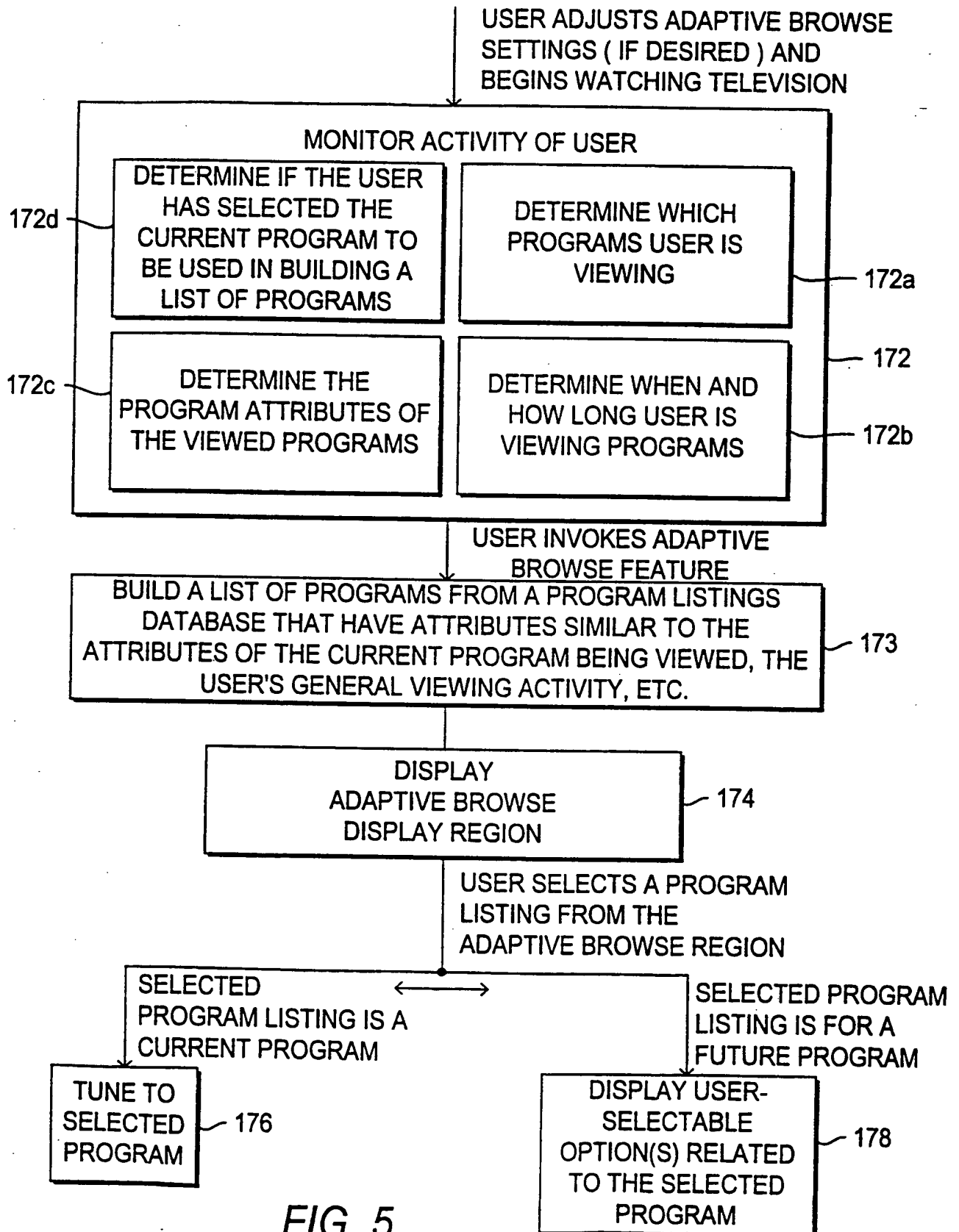
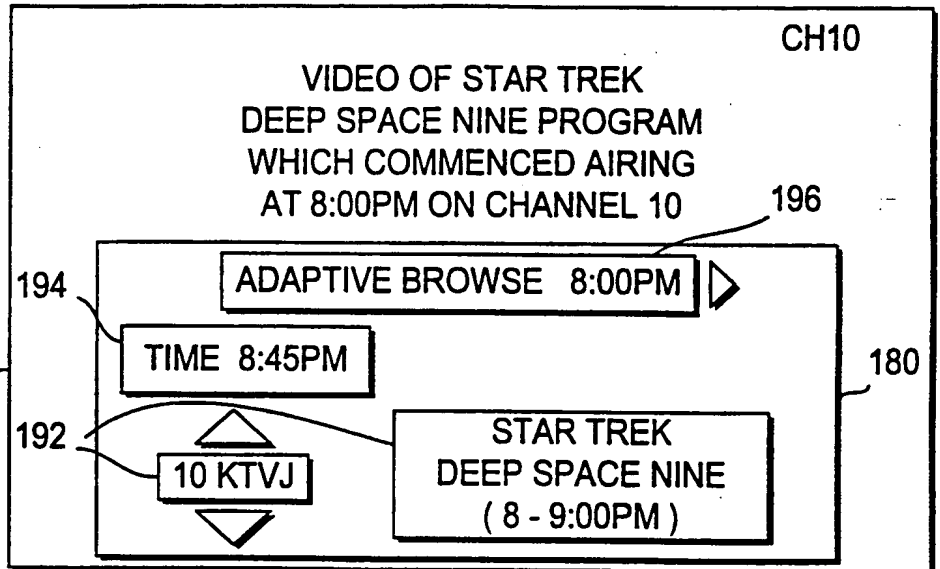


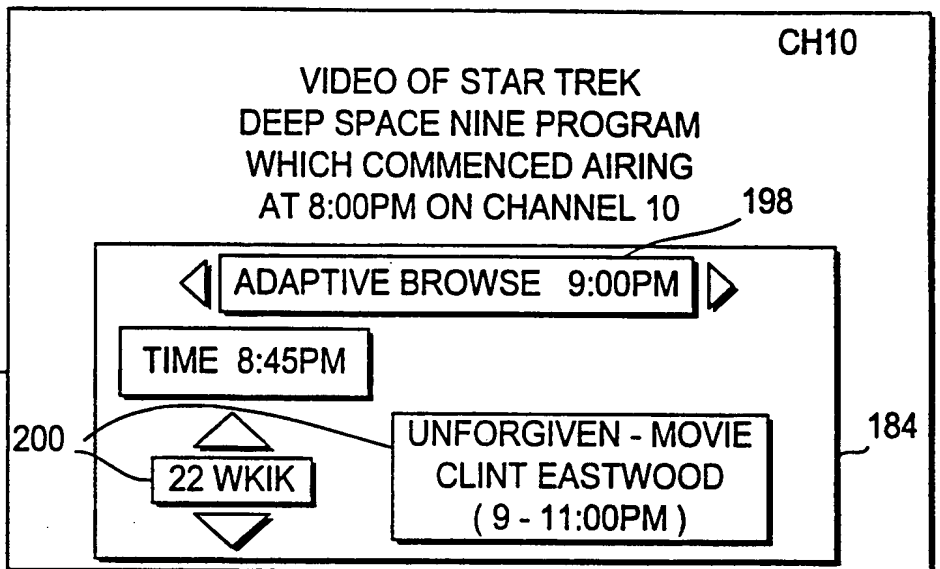
FIG. 5

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USER PRESSES  
ADAPTIVE BROWSE  
FUNCTION AND  
DIRECTIONAL ARROW  
KEYS OF REMOTE  
CONTROL



USER PRESSES  
ADAPTIVE BROWSE  
FUNCTION AND RIGHT  
ARROW KEY OF  
REMOTE CONTROL



USER PRESSES  
ADAPTIVE BROWSE  
FUNCTION AND DOWN  
ARROW KEY OF  
REMOTE CONTROL

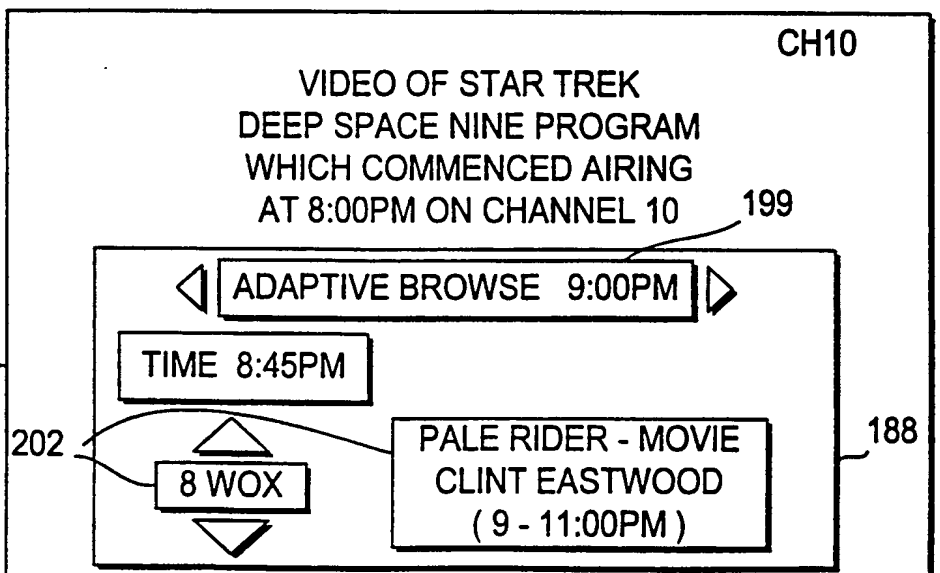


FIG. 6

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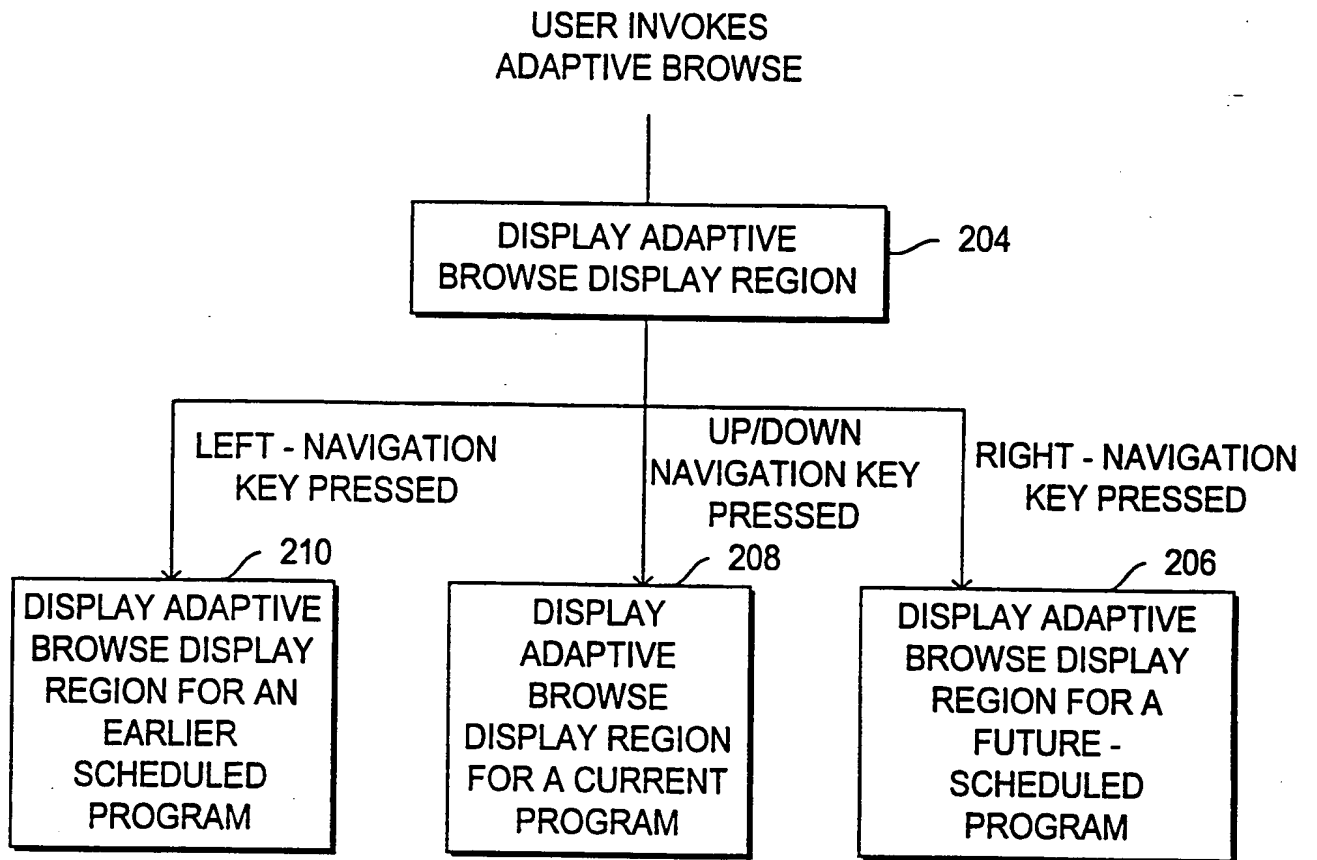


FIG. 7

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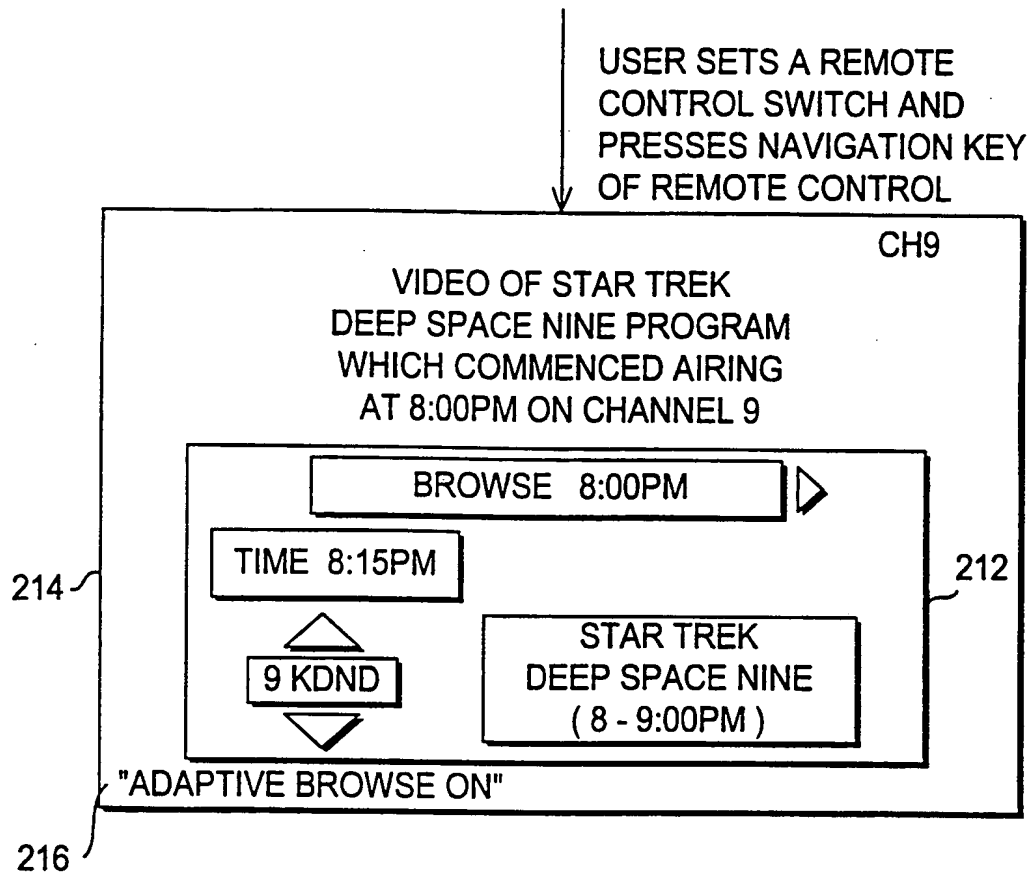


FIG. 8



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USER PRESSES ADAPTIVE  
BROWSE FUNCTION KEY AND A  
NAVIGATION KEY OF REMOTE  
CONTROL IN SEQUENCE

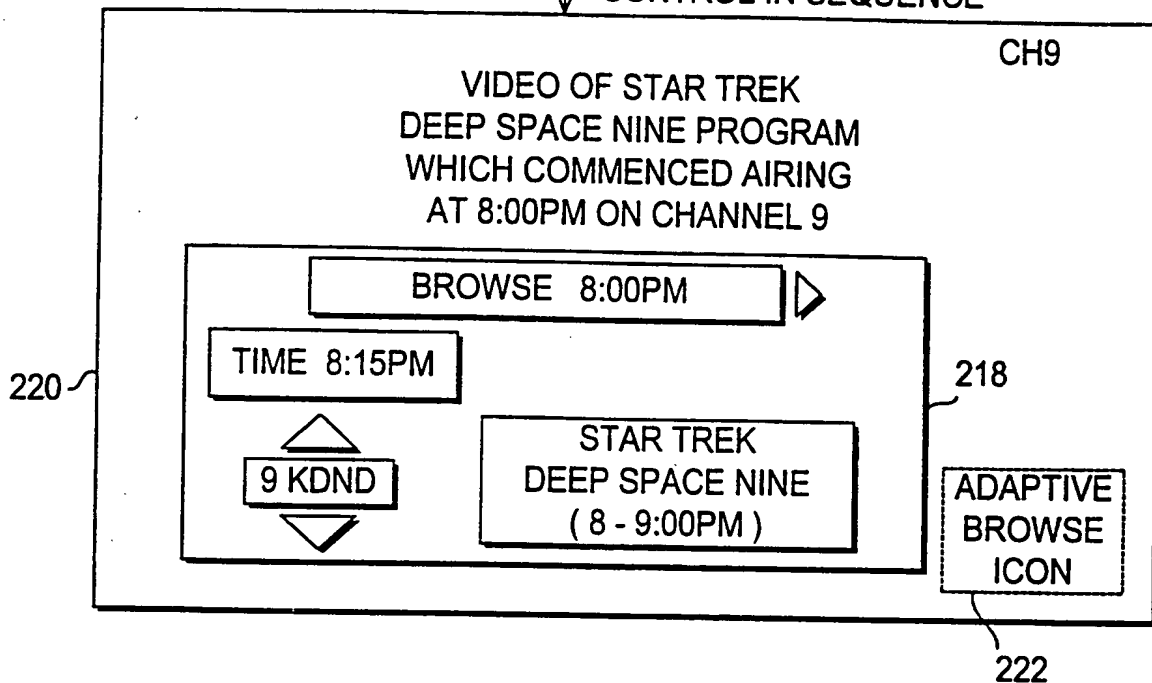


FIG. 9

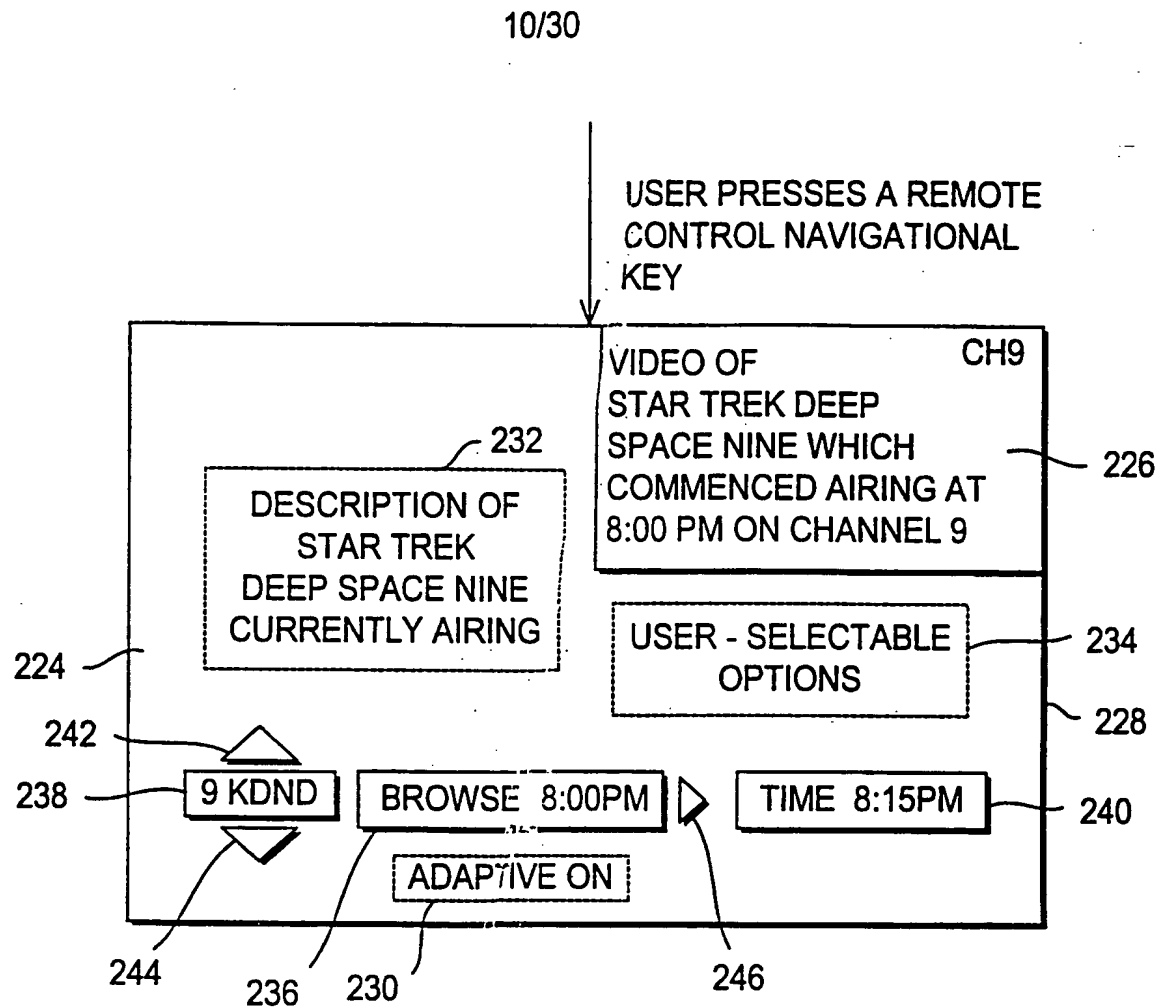


FIG. 10

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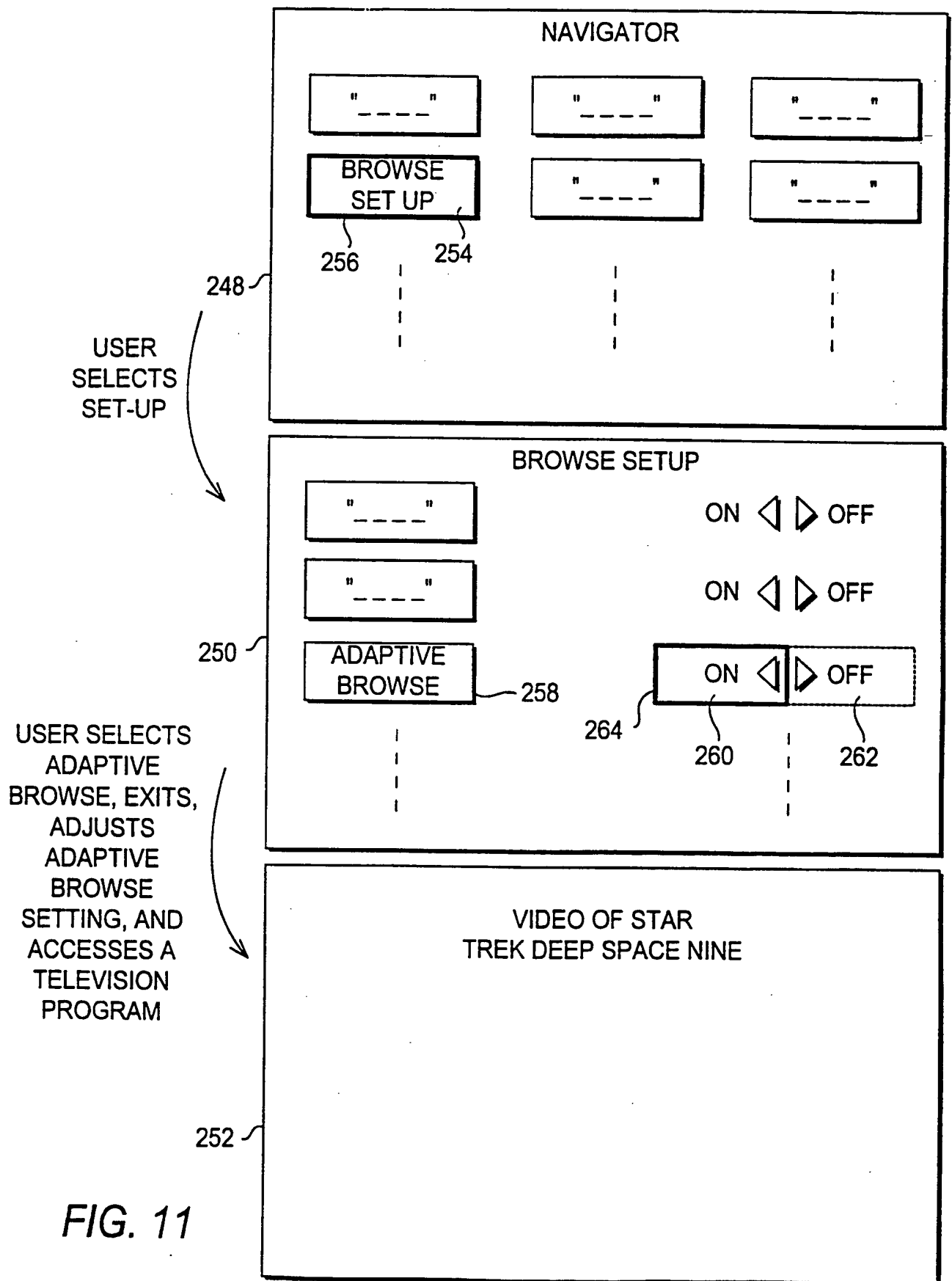
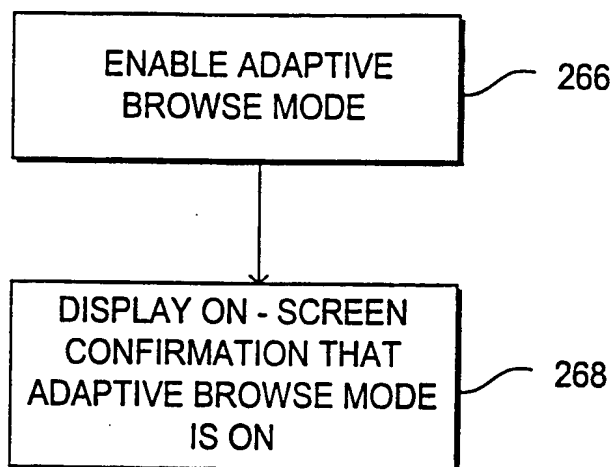


FIG. 11

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*FIG. 12*

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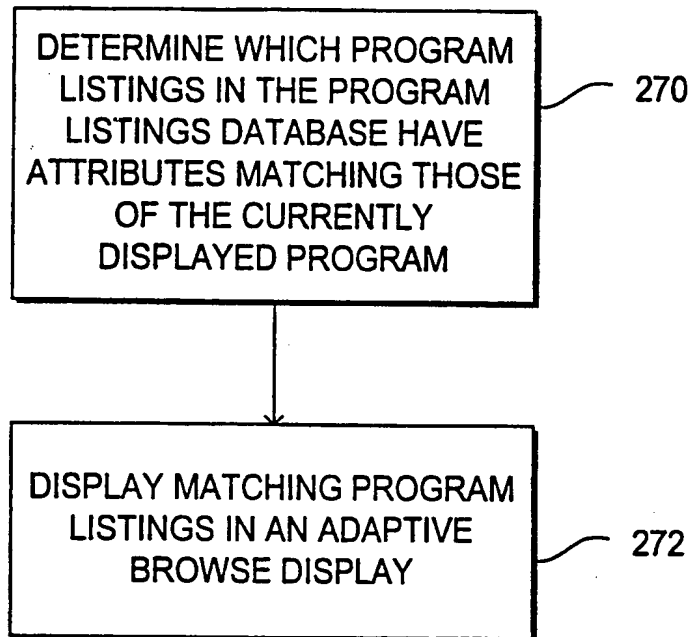
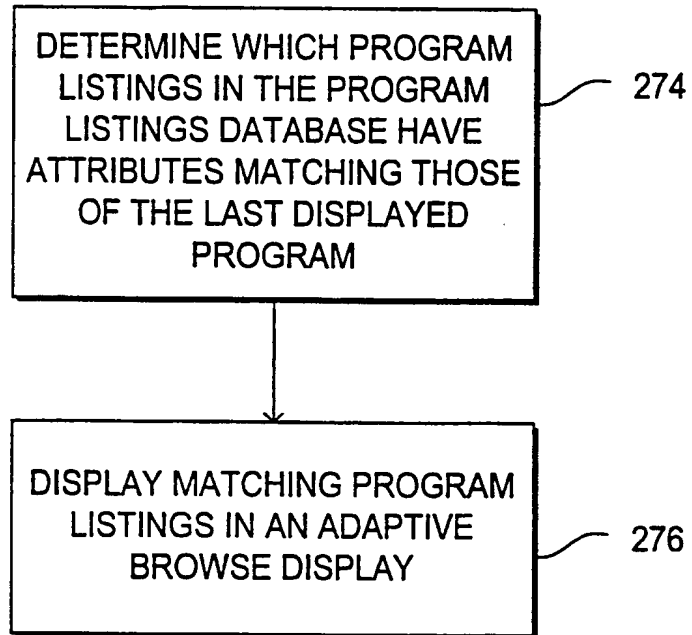
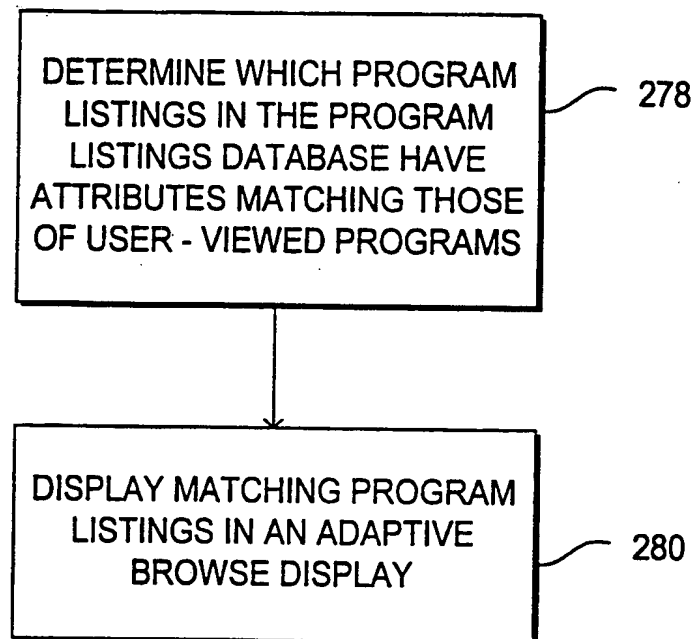


FIG. 13

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*FIG. 14*

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*FIG. 15*

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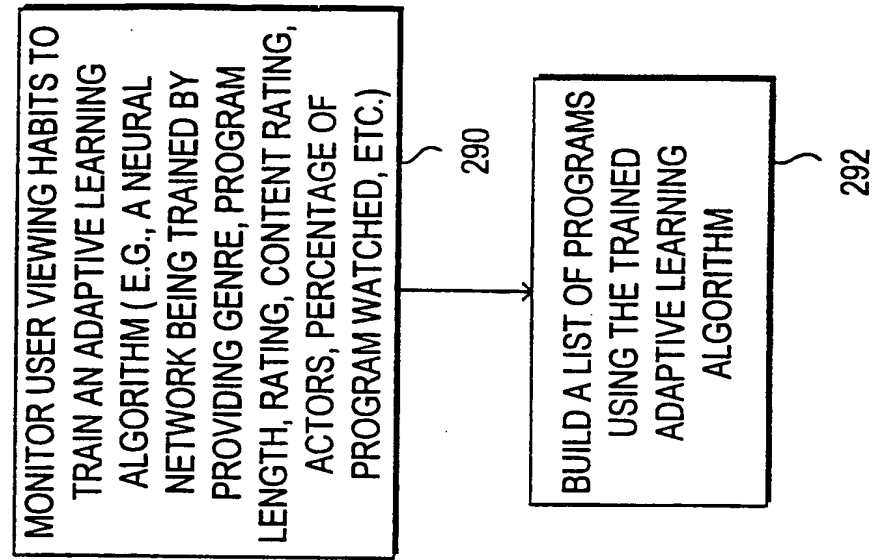


FIG. 16c

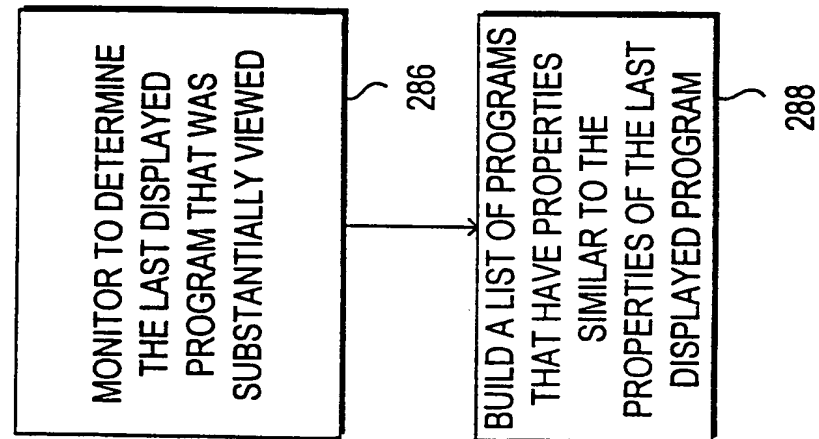


FIG. 16b

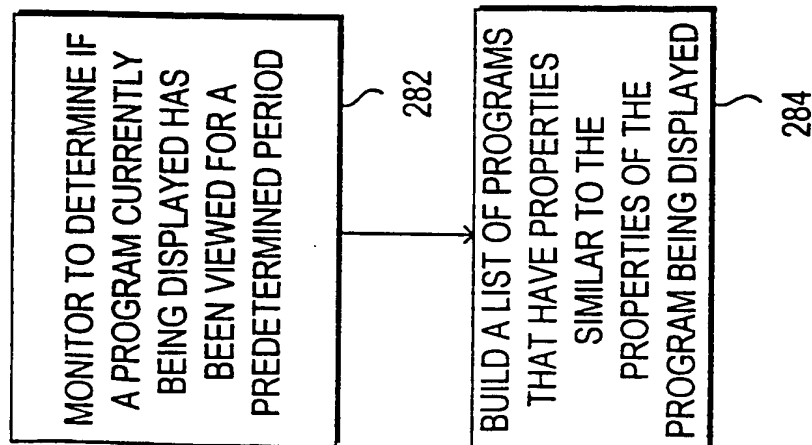


FIG. 16a



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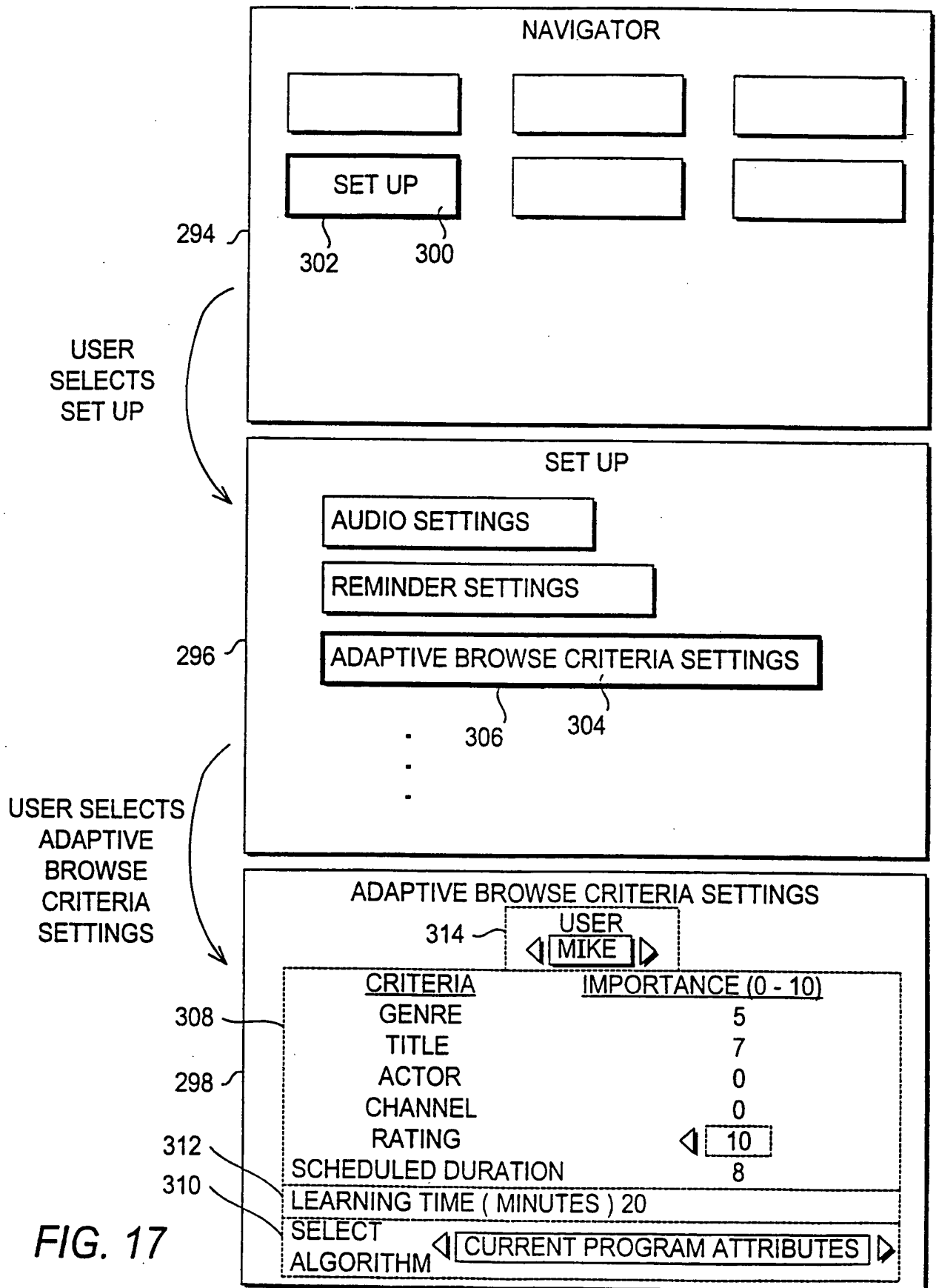
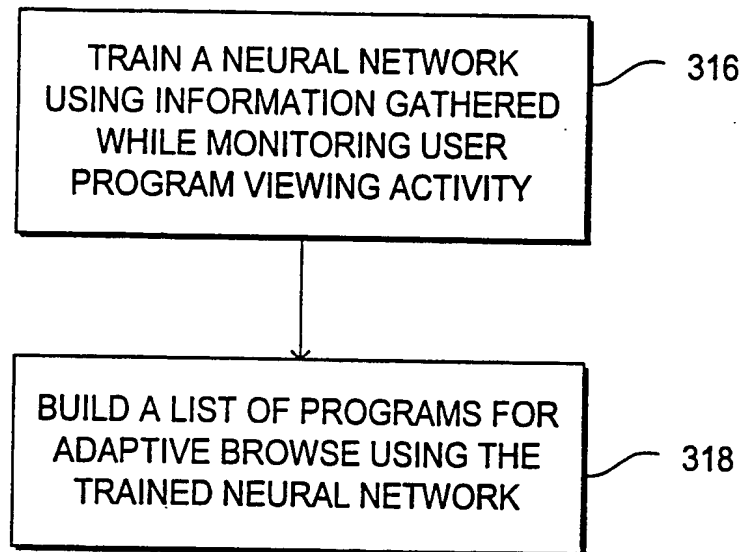
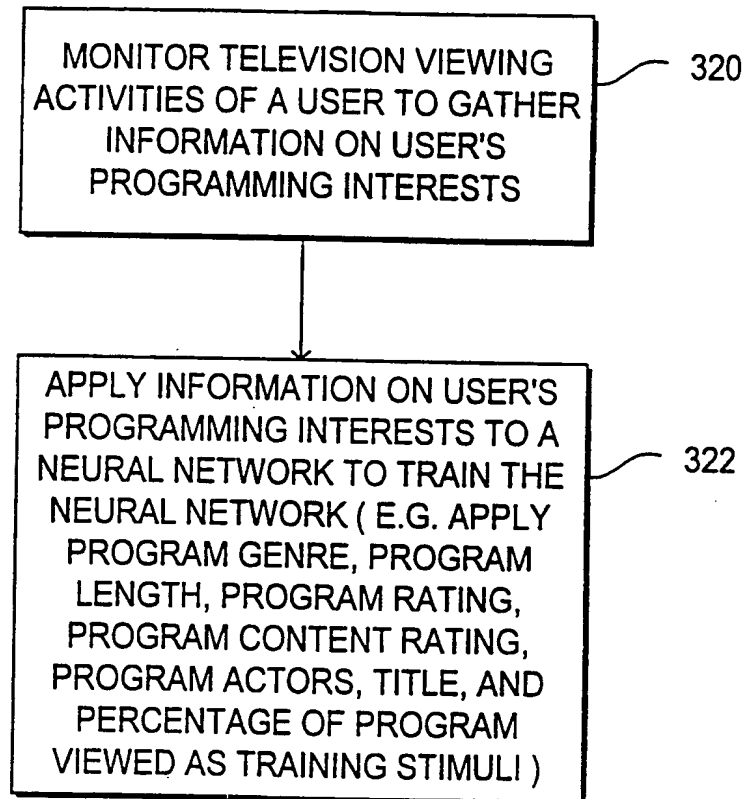


FIG. 17

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*FIG. 18*

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**FIG. 19**

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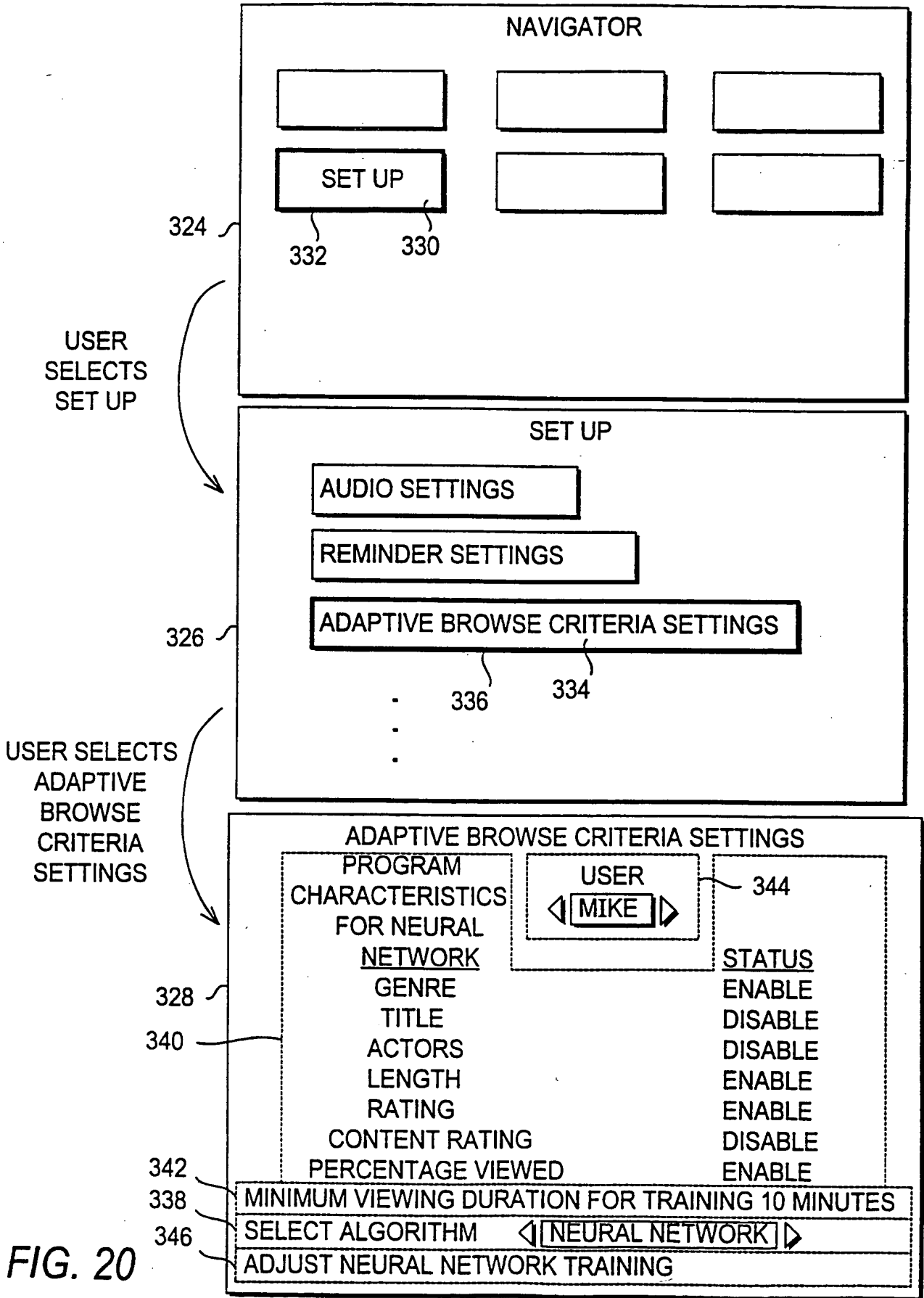


FIG. 20

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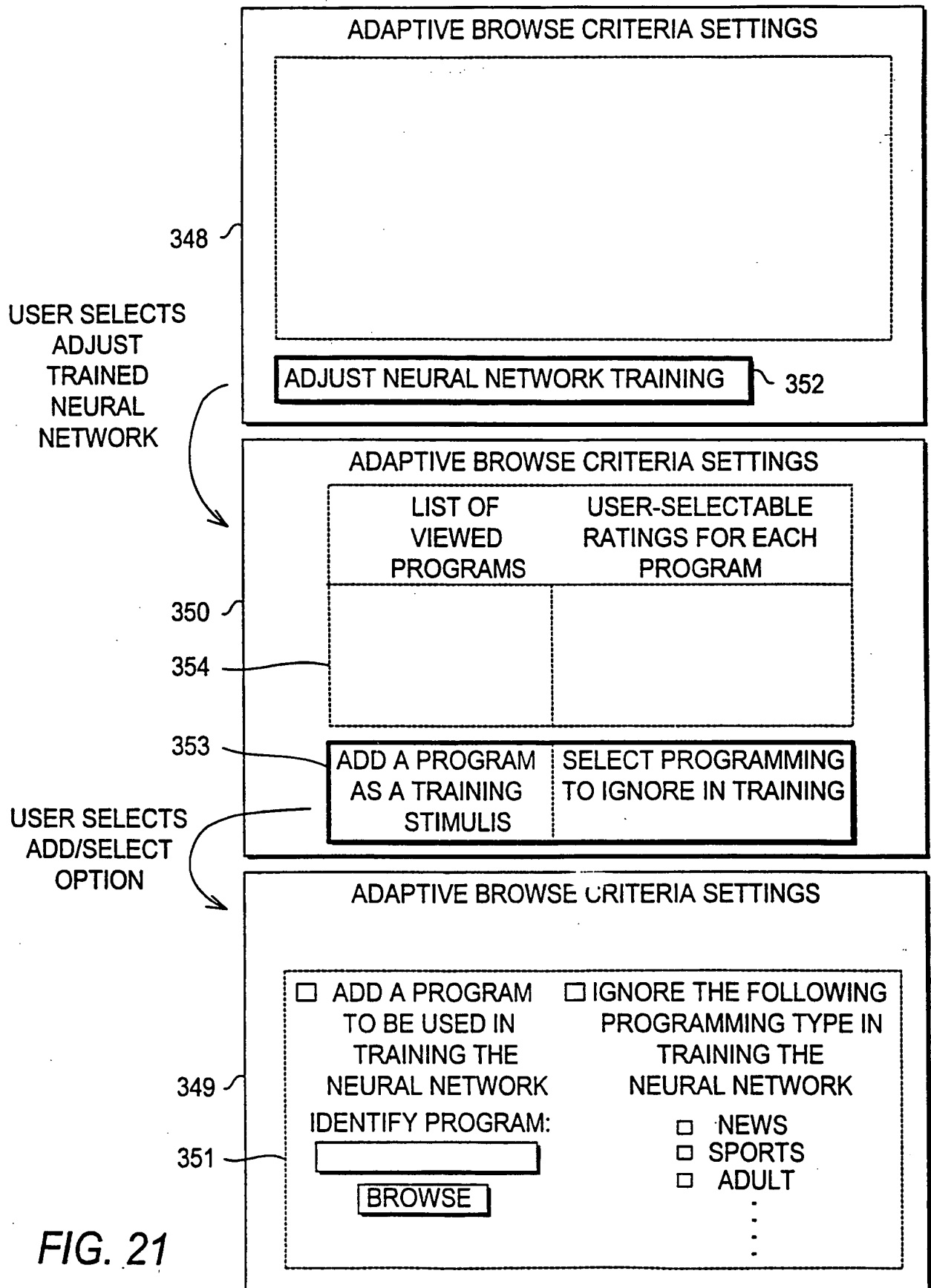


FIG. 21

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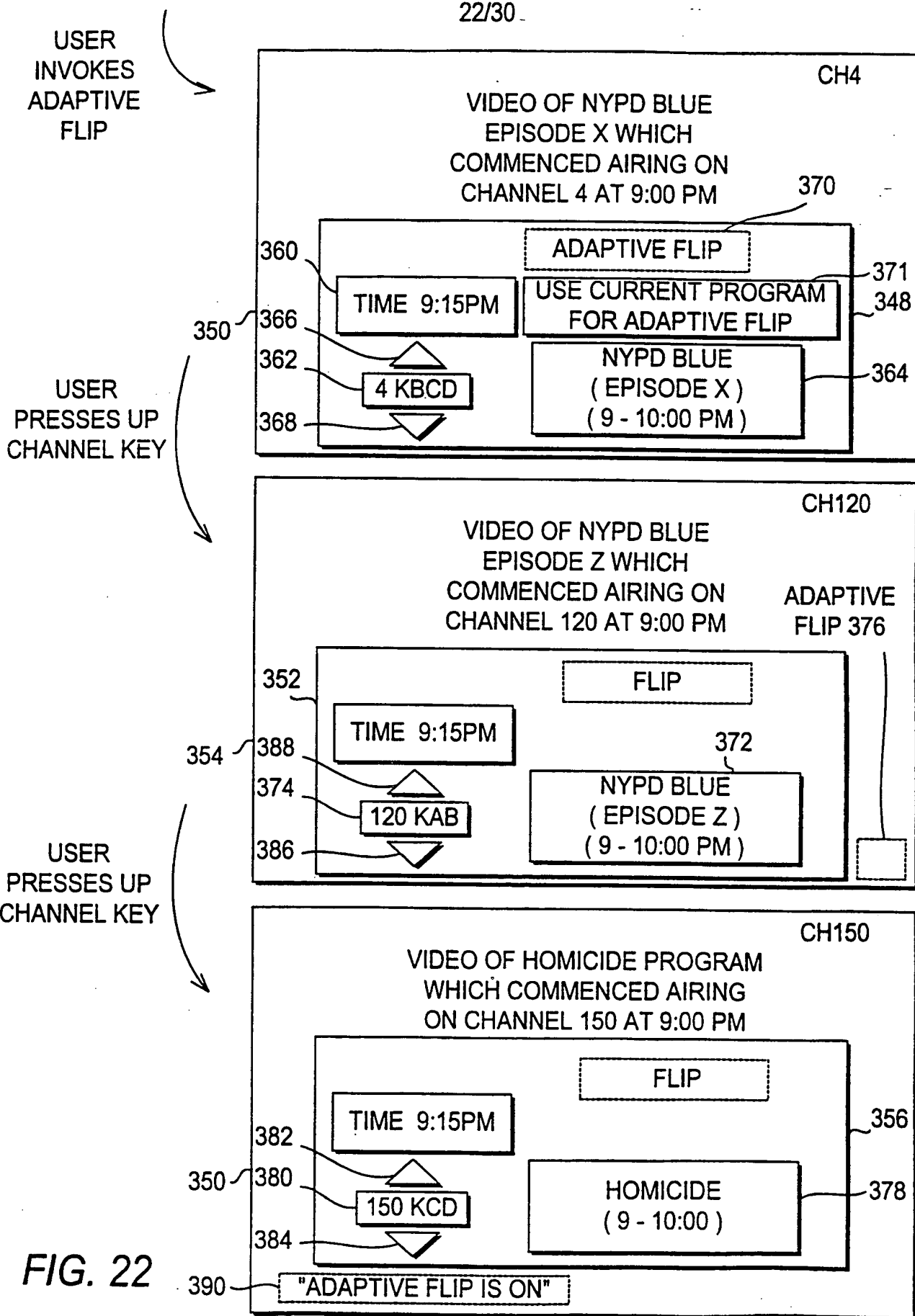


FIG. 22

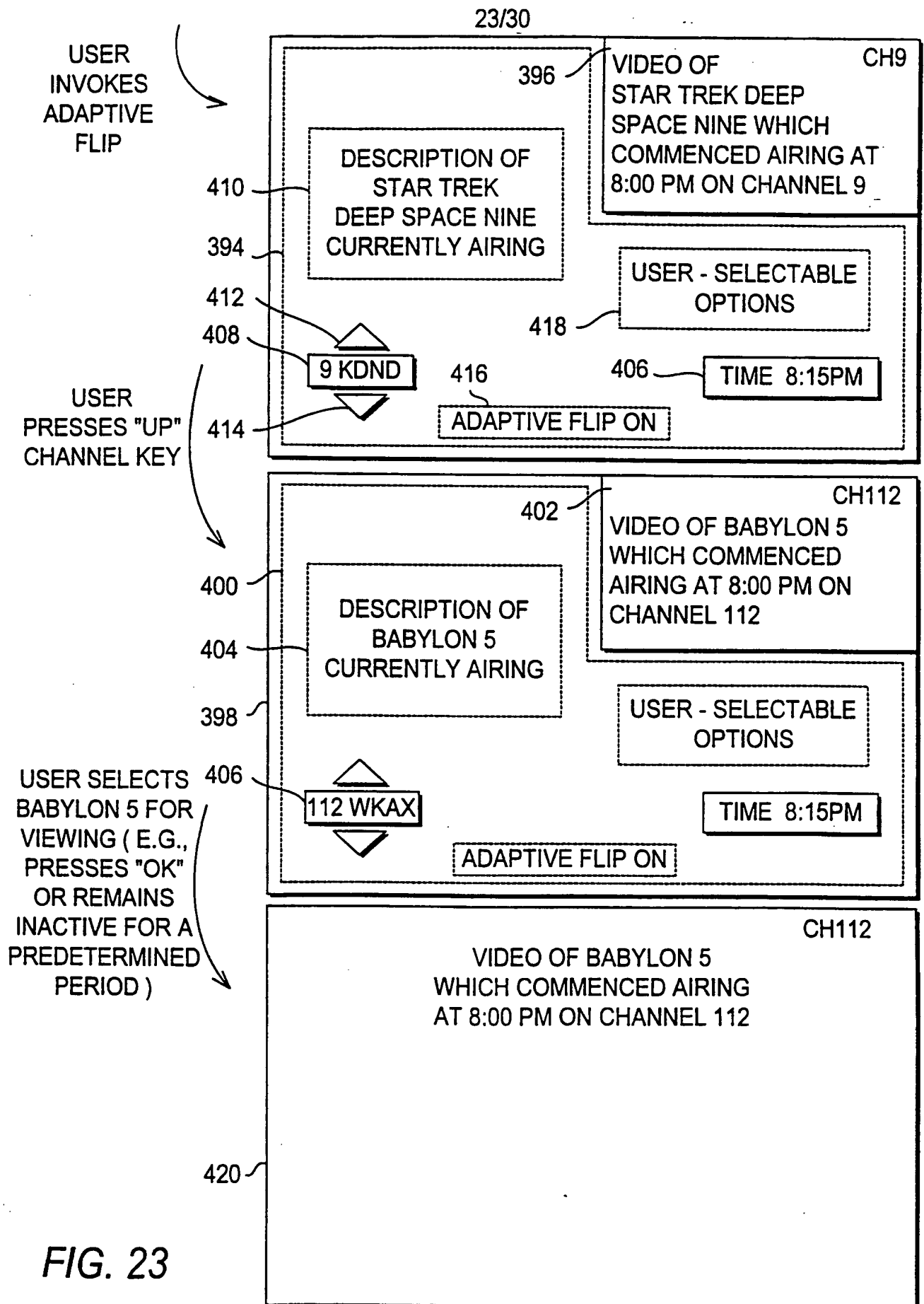
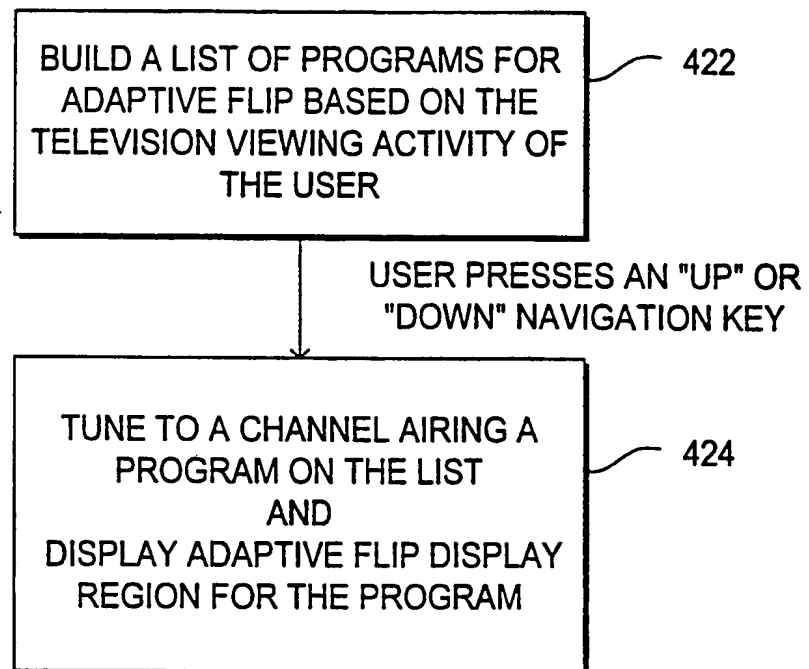


FIG. 23

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*FIG. 24*



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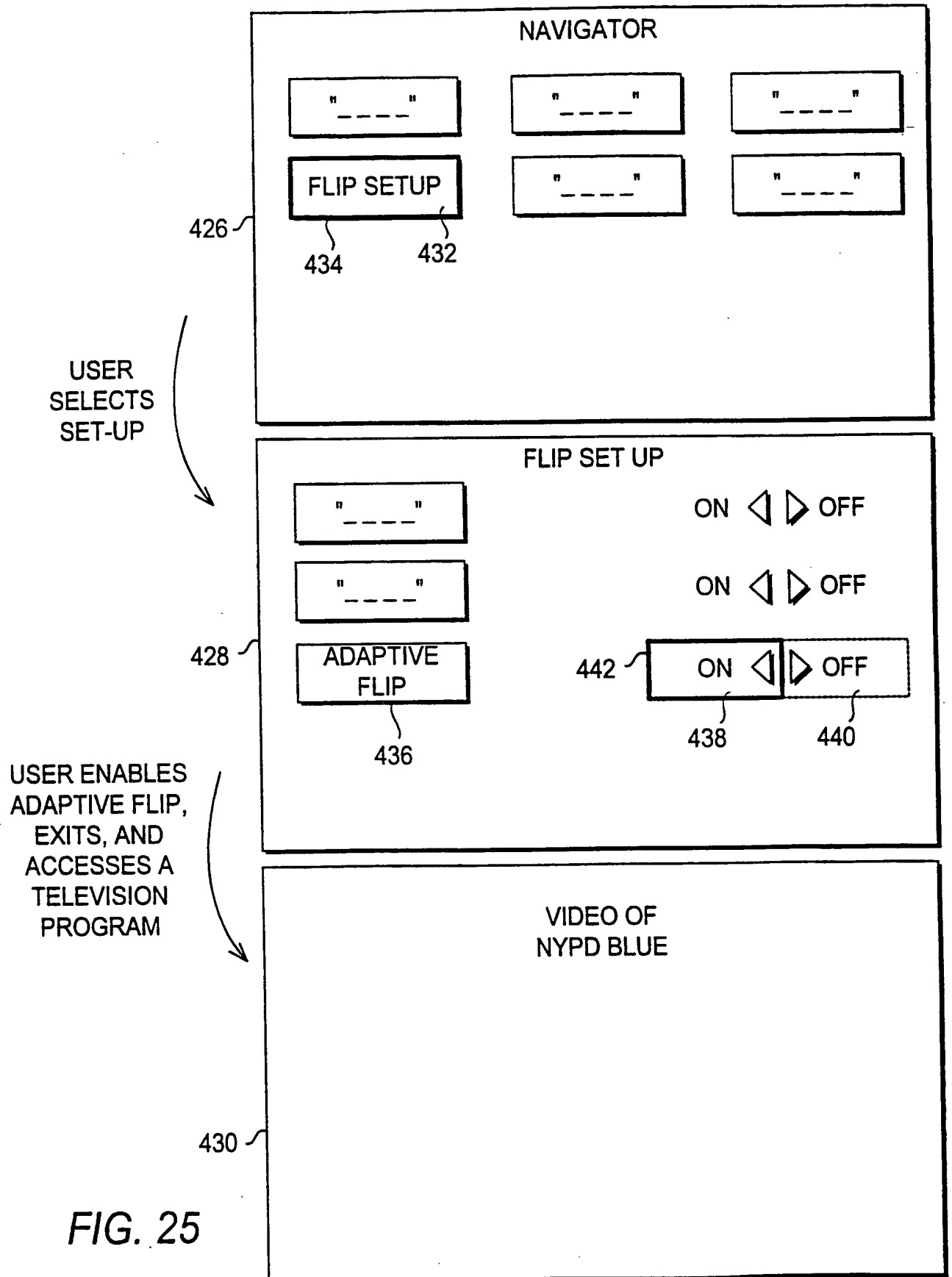
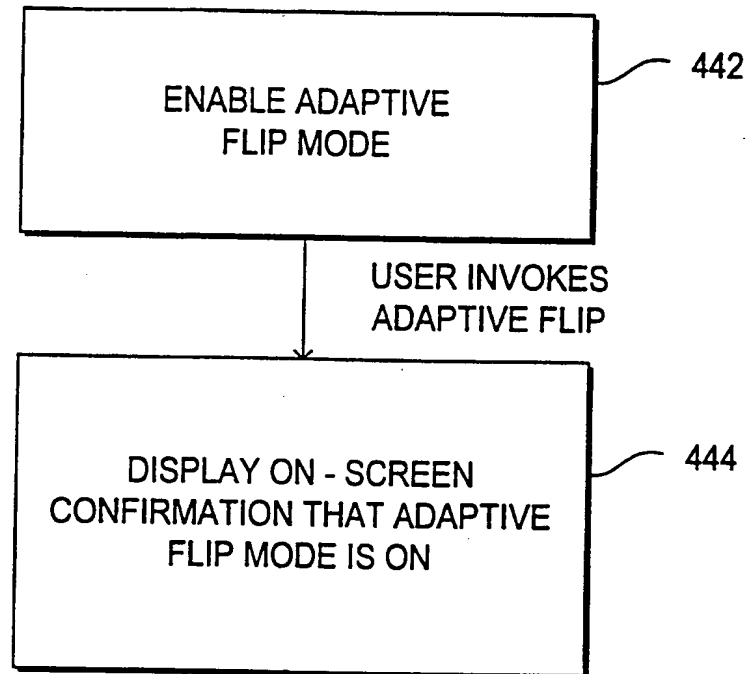
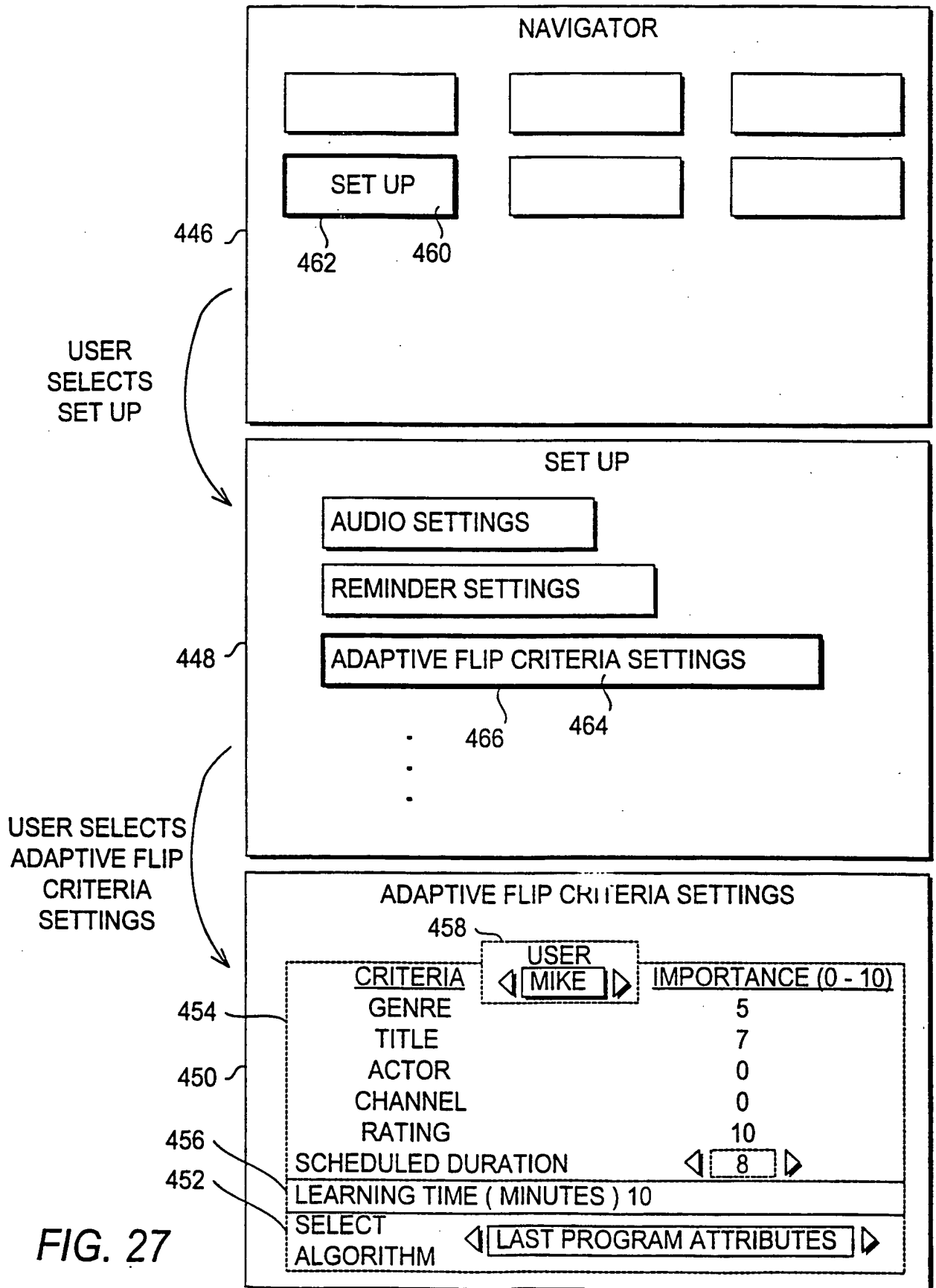


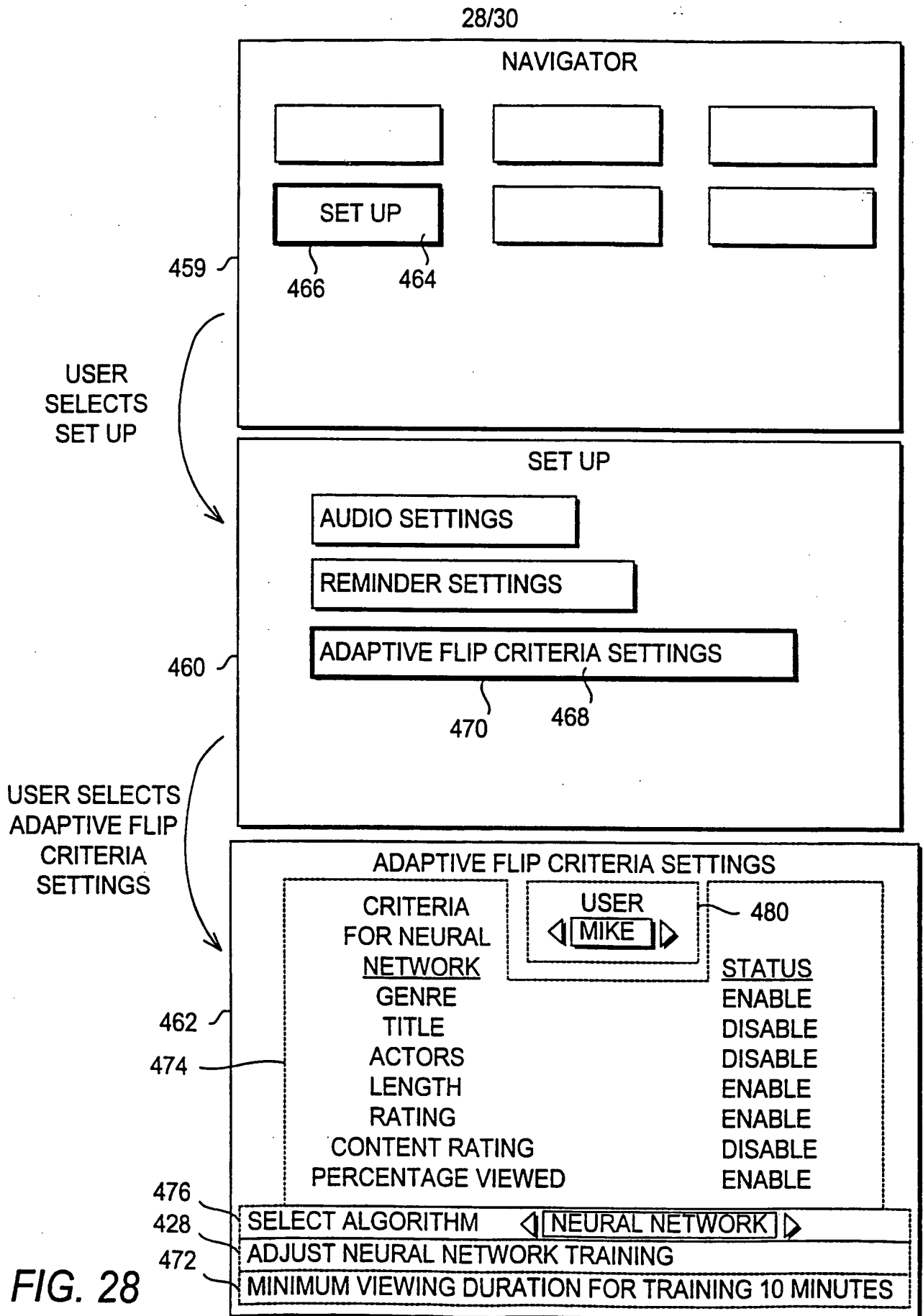
FIG. 25

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*FIG. 26*

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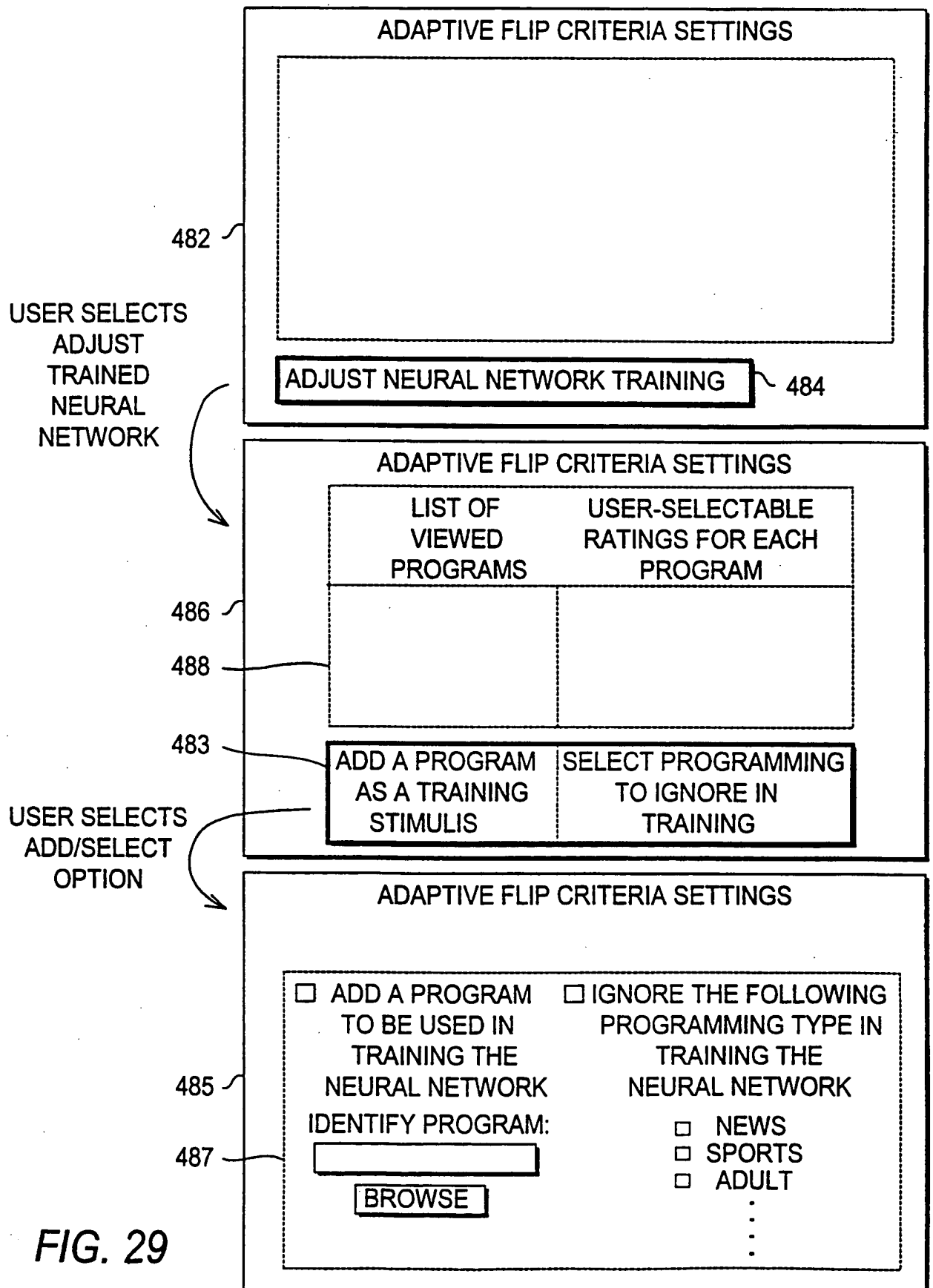
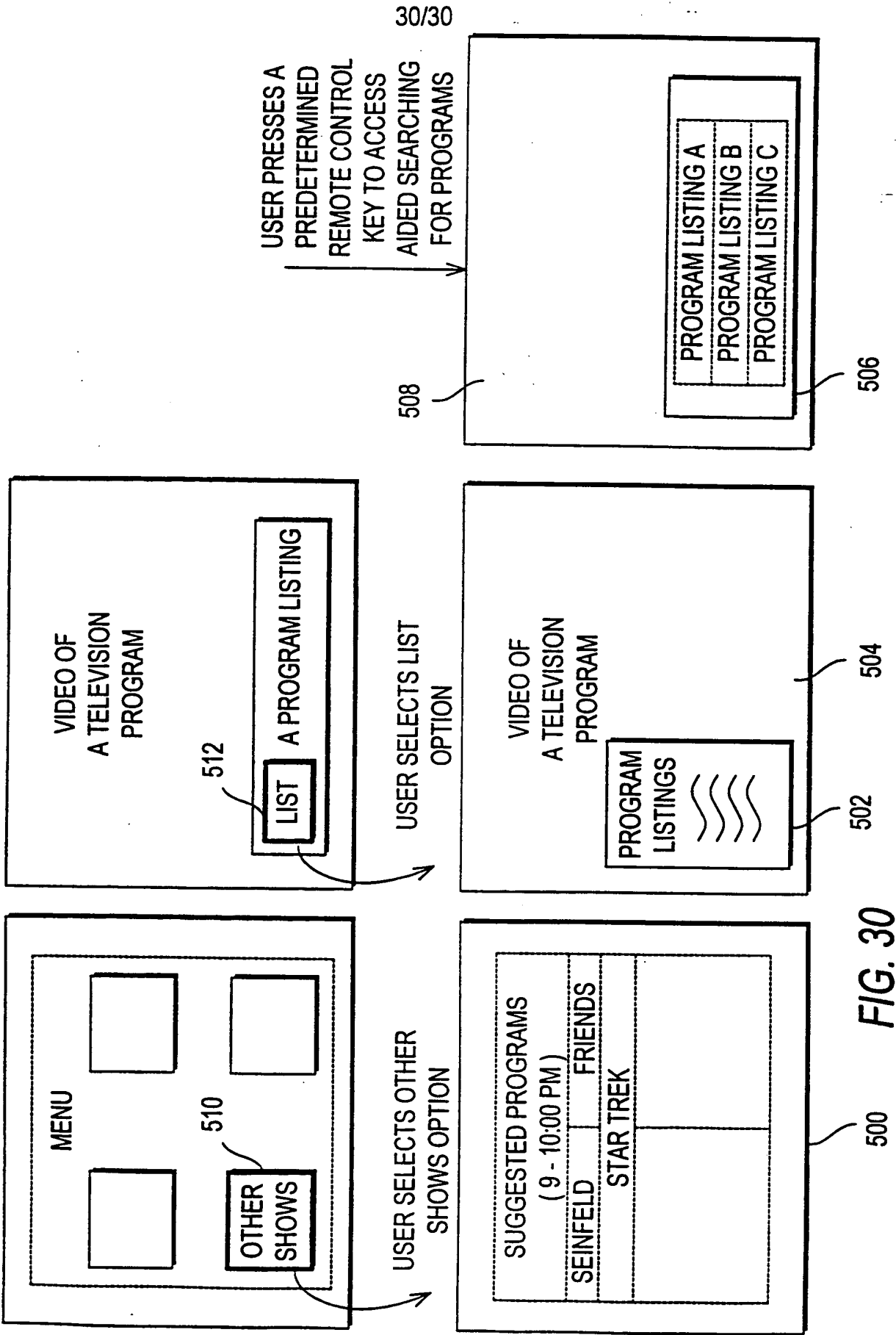


FIG. 29



# INTERNATIONAL SEARCH REPORT

International Application No.

PC1/US 99/16040

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 H04N5/445 H04N7/088

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X  Y	<p>WO 97 49242 A (HUNWICH KEITH ; SCHEIN STEVEN (US); ALBA THERESA (US); FOLKER DAVID) 24 December 1997 (1997-12-24)</p> <p>abstract            page 1, line 27 -page 5, line 30            page 17, line 3 -page 24, line 37            ---            -/--</p>	<p>1, 27, 53,            79, 103,            127            2-26,            28-52,            54-78,            80-102,            104-126,            128-177</p>

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

20 October 1999

Date of mailing of the international search report

04/11/1999

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Authorized officer

Ibruegger, J

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 99/16040

**C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category <sup>2</sup>	Citation of document, with indication, where appropriate, of the relevant passages <sup>3</sup>	Relevant to claim No.
Y	<p>WO 95 15658 A (DISCOVERY COMMUNICAT INC) 8 June 1995 (1995-06-08)</p> <p>page 2, line 2 -page 4, line 25 page 5, line 29 -page 7, line 2 page 20, line 9-17 page 22, line 25 -page 24, line 8 page 58, line 9 -page 60, line 16</p>	<p>2-26, 28-52, 54-78, 80-102, 104-126, 128-177</p>
Y	<p>US 5 534 911 A (LEVITAN GUTMAN) 9 July 1996 (1996-07-09)</p> <p>the whole document</p>	<p>2-26, 28-52, 54-78, 80-102, 104-126, 128-177</p>
P,Y	<p>US 5 798 785 A (BONNER ALFRED E ET AL) 25 August 1998 (1998-08-25)</p> <p>abstract column 1, line 25 -column 3, line 49 column 28, line 64 -column 38, line 28</p>	<p>2-26, 28-52, 54-78, 80-102, 104-126, 128-177</p>



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